

VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor, industrial permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The industrial discharge consists of treated wastewater resulting from the operations at a poultry processing facility (slaughter, meat cut preparations, packaging for human consumption and poultry processing for pet food), facility cleaning operations, and facility domestic sanitary waste. This permit action consists of updating the facility name, permit boilerplate and special conditions and evaluating current monitoring conditions.

1. **Owner Name:** Tyson Foods, Inc.
Owner Mailing Address: 13264 Mountain Road
Glen Allen, VA 23059

Facility Name: Tyson Farms, Inc.
Location: 13264 Mountain Road
Glen Allen, VA 23059

SIC Code: 2015 – Poultry Slaughtering and Processing
2. **Permit Number:** VA0004031
Existing Permit Expiration Date: November 13, 2010
3. **Owner Contact:** Tim Lockhart, Complex Environmental Manager
Telephone Number: 804-798-8357, ext. 305
Email Address: tim.lockhart@tyson.com
4. **Application Administratively Complete Date:** August 10, 2011
Application Technically Complete Date: August 10, 2011
Permit Drafted By: Janine Howard Date: 4/21/2014
DEQ Regional Office: Piedmont
Reviewed By: Emilee Adamson Date: 7/7/14
Public Comment Period Dates: TBD
5. **Receiving Stream Name:** Chickahominy River, UT
River Mile: Outfall 001 2-XDD001.12; Outfall 002 2-XDD000.95
Basin: James River
Subbasin: James River (Lower)
Section: 4 (as per 9VAC25-260-410)
Class: III (free flowing or nontidal)
Special Standards: m (Chickahominy watershed)

7-Day, 10-Year Low Flow: 0.0 MGD	7-Day, 10-Year High Flow: 0.0 MGD
1-Day, 10-Year Low Flow: 0.0 MGD	1-Day, 10-Year High Flow: 0.0 MGD
30-Day, 5-Year Low Flow: 0.0 MGD	30-Day, 10-year High Flow: 0.0 MGD
30-Day, 10-year Low Flow: 0.0 MGD	Harmonic Mean Flow: 0.0 MGD
Tidal? No	On 303(d) list? Yes

Attachment A – Flow Frequency Memo and Fact Sheets for 303(d) Waters

6. **Operator License Requirements:** The Virginia Department of Professional and Occupational Regulation requires licensed operators for wastewater works. A wastewater works using biological treatment methods with a design hydraulic capacity greater than 0.5 MGD but less than 5.0 MGD requires a Class II licensed operator (18VAC160-20-130.C & 9VAC25-31-200.C).
7. **Reliability Class:** N/A for industrial discharges.

8. **Permit Characterization:**
☒ Private ☐ Federal ☐ State ☐ POTW ☐ PVOTW
☐ Possible Interstate Effect ☐ Interim Limits in Other Document

9. **Discharge Description:**

OUTFALL NUMBER	DISCHARGE SOURCE	TREATMENT	FLOW
001	Wastewater Treatment Plant discharge from: operations at poultry processing facility (slaughter, meat cut preparations, packaging for human consumption and poultry processing for pet food), facility cleaning operations, and facility domestic sanitary waste ($\leq 5\%$ of flow), and stormwater runoff.	Screening, acidulation, dissolved air floatation, and flow equalization units precede biological treatment. An activated sludge basin with suspended growth nitrification for ammonia removal, secondary clarification, chemical precipitation, tertiary sand filters, and UV disinfection are used to treat the wastewater prior to final discharge. The UV disinfection system with emergency chlorination/dechlorination back-up became operational on 10/26/2010.	1.25 MGD Design Flow
002	Stormwater runoff from part of the processing facility roof area, the bioretention basin, and other impervious areas of the site.	Bio-retention basin.	>1.25 MGD

Tyson Farms, Inc. – Glen Allen Complex is a poultry processing plant. Process wastewater and stormwater (40% of site runoff) is treated by the onsite wastewater treatment facility and discharged via Outfall 001. The remainder of the storm water runoff from the site is collected in the drainage network and/or bioretention basin before being channeled off site. The bioretention basin was installed in 2010 specifically to collect the first inch of rainfall in the area where the live bird receiving takes place. Its installation was part of a Supplemental Environmental Project required by the 2009 Consent Order. Storm water runoff collected in the basin and other storm water drainage channels ultimately converges with the main channel that carries effluent from the wastewater treatment plant off site. However, the compliance point for Outfall 002 is prior to the point at which the wastewater treatment plant effluent and the stormwater mix. Hence, the storm water samples are not comingled with treated process wastewaters.

Offal, blood and feathers from poultry processing are sent to an offsite rendering facility. Solid wastes from the wastewater treatment plant are trucked off-site.

Attachment B – Site Diagrams and Location Map

10. **Sewage Sludge Use or Disposal:** Sludge (wet and pressed) generated in the wastewater treatment process ($\leq 5\%$ flow from domestic connections and $\geq 95\%$ flow from industrial sources) is sent off-site. Wet sludge (removed from the DAF with coagulants) is hauled to a rendering facility (Pilgrim's Pride) in Timberville, VA. Pressed sludge (waste activated sludge) is sent to Synagro, Inc.
11. **Discharge(s) Location Description:** Attachment B – Glen Allen, VA topographic map (127A).
12. **Material Storage:** All materials (including anhydrous ammonia, aluminum sulfate, calcium hydroxide, chlorine gas, magnesium hydroxide, sulfuric acid, propane, various sanitation/cleaning chemicals) the facility uses are stored, loaded and unloaded in covered areas. Diesel contained at the facility within four above ground storage tanks (AST) (storage capacity of 3242, 3242, 3242, 3029 gallons) and one underground storage tank (UST) (storage capacity of 15,000 gallons) are registered and regulated by the DEQ Petroleum Storage Tanks program.
13. **Ambient Water Quality Information:** The receiving stream at the point of discharge is considered a

dry ditch with a 1Q10 and a 7Q10 of 0 MGD, thus theoretical low flows are comprised entirely of effluent. Under these low flow conditions, ambient data are not applicable for limitation development; instead, effluent data from the permit application and representative Discharge Monitoring Reports (DMRs) were used to analyze permit limitations. See **Attachment A** for the Flow Frequency Determination provided by Jennifer V. Palmore, Senior Environmental Planner, of the DEQ PRO Planning Department.

14. **Antidegradation Review & Comments:**

Tier: 1 X 2 _____ 3 _____

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. Due to its intermittent nature (no sustainable or measurable flow), the receiving stream is considered a Tier 1 waterbody.

15. **Site Inspection:** Date: August 30, 2013
Performed by: Shawn Weimer, PRO

Attachment C – Site inspection Report

16. **Effluent Screening & Limitation Development:**

a. Process Wastewater Discharge (Outfall 001):

Limitations reflect the application of Virginia Water Quality Standards and Criteria (VA WQS), 9VAC25-260, including the Chickahominy watershed limitations applicable to process wastewater discharges, 9VAC25-260-310 m; Federal Effluent Limitation Guidelines (FELGs) for Poultry First Processing facilities, 40 CFR 423 Subpart K (Best Practicable Control Technology currently available (BPT) and Best Available Technology economically achievable (BAT) requirements) (see **Attachment D** for the FELGs); nutrient regulations and guidance; and best professional judgement.

A limitation evaluation for the application of the VA WQS is performed in order to identify pollutants that may have reasonable potential to cause or contribute to a violation of water quality standards. This begins with a wasteload allocation analysis using MSTRANTI version 2b (a DEQ excel spreadsheet). Acute and chronic waste load allocations are calculated from criteria for surface water given in the VA Water Quality Standards (9VAC 25-260-140). Statistically derived permit limits are then obtained by inputting these acute and chronic waste load allocations along with reported data or default data values (see below) and required quantification limits into the DEQ statistical program (STATS.exe). Monitoring frequencies used in STATS.exe are those required in the current permit reissuance. The constituents identified in the application that require a reasonable potential analysis are total residual chlorine, chlorides, cadmium, total recoverable selenium, hydrogen sulfide, zinc, and ammonia. Radionuclides were also reported in measureable concentrations and are addressed in the Human Health Evaluation below.

See **Attachment E** for facility effluent data submitted with and as part of the application and reported on Discharge Monitoring Reports (DMRs).

See **Attachment F** for MSTRANTI printouts with WLAs and applicable STATS.exe analyses.

Table 1. Basis for Effluent Limitations: Outfalls 001- Process Water

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS			MONITORING REQUIREMENTS	
		MONTHLY AVG	DAILY MIN	DAILY MAX	FREQ	SAMPLE TYPE
001 Flow (MG)	NA	NL	NA	NL	Continuous	TIRE
002 pH (SU)	2	NA	6.0	9.0	1 per Day	Grab
003 BOD ₅ (mg/L)	3	6.0	NA	8.0	3 per Week	24HC
003 BOD ₅ (kg/D)	3	28	NA	38	3 per Week	24HC
004 TSS (mg/L)	3	5.0	NA	7.5	3 per Week	24HC
004 TSS (kg/D)	3	24	NA	35	3 per Week	24HC
006 Fecal coliform (MPN/100 mL)	4	NL	NA	400	1 per Month	Grab
120 <i>E. coli</i> (MPN/100mL)	2, 7	126 MPN/100 mL (geometric mean)	NA	NA	5 Days per Week	Grab (between 10am-4pm)
007 DO (mg/L)	2	NA	5.0	NA	1 per Day	Grab
012 Total Phosphorus (mg/L)	3	0.3	NA	0.5	3 per Week	24HC
794 Total Phosphorus, Annual Load (kg/year)	8	NA	NA	185	1 per Year	Calculated
794 Total Phosphorus, Calendar Year Average (mg/L)	5, 6	0.1	NA	NA	1 per Year	Calculated
806 Total Phosphorus, Year-to-Date (mg/L)	5	NL	NA	NA	1 per Month	Calculated
792 Total Nitrogen, Calendar Year Average (mg/L)	5, 6	6.0	NA	NA	1 per Year	Calculated
805 Total Nitrogen – Year-to-Date (mg/L)	5	NL	NA	NA	1 per Month	Calculated
039 Ammonia-N (mg/L)	3, 4	2.0	NA	8.0	3 per Week	24HC
039 Ammonia-N (kg/D)	3,4	9.5	NA	38	3 per Week	24HC
071 Settleable Solids (ml/L)	3	0.1	NA	NL	1 per Week	Grab
196 Zinc, Total Recoverable (µg/L)	2	190	NA	190	1 per Month	Grab
801 Oil & Grease (as HEM) (mg/L)	4	8.0	NA	14	1 per Week	Grab
801 Oil & Grease (as HEM) (kg/D)	4	38	NA	66	1 per Week	Grab
145 Chlorides (mg/L) (Interim)	1	NL	NA	NL	1 per Month	Grab
145 Chlorides (mg/L) (Final)	2	340	NA	340	1 per Month	Grab
408 Selenium, Total Recoverable (µg/L) (Interim)	1	NL	NA	NL	1 per Month	Grab
408 Selenium, Total Recoverable (µg/L) (Final)	2	7.3	NA	7.3	1 per Month	Grab
202 Cadmium, Total (µg/L) (Interim)	1	NL	NA	NL	1 per Month	Grab
202 Cadmium, Total (µg/L) (Final)	2	5.0	NA	5.0	1 per Month	Grab
720 Toxicity, Chronic (TU _C)[<i>C.dubia</i>] (Interim)	1	NA	NA	NL	1 per Quarter	24HC
720 Toxicity, Chronic (TU _C)[<i>C.dubia</i>] (Final)	2	NA	NA	1.38	1 per Quarter	24HC

NA = Not applicable

NL = No limitation

- (1) Permit writer judgement based on Water Quality Standards
- (2) Water Quality Standards (9VAC 25-260 effective 1/6/11) or Water Quality Based Effluent Limitations
- (3) Chickahominy Special Standards, 9VAC25-260-310 m
- (4) Federal Effluent Limitations Guidelines, 40 CFR 423.112 (Subpart K- Poultry First Processing)
- (5) Nutrient Regulations and DEQ Guidance (GM07-2008, Amendment 2)
- (6) Technology-based limits
- (7) The Chickahominy River and Tributaries Bacterial TMDL (EPA approved 9/19/2012, DEQ approved 3/25/2013)
- (8) The Unnamed Tributary to the Chickahominy River TMDL for a benthic impairment (EPA approved 8/5/2004, DEQ approved 3/15/2005)

*No more than 5% of the individual samples collected during the reporting month shall exceed the daily maximum effluent limit.

pH: A pH limitation of 6.0-9.0 Standard Units is assigned to all Class III waters in accordance with VA Water Quality Standards, 9VAC 25-260-50.

Biological Oxygen Demand (BOD₅): The BOD₅ limitation is determined by the Chickahominy special standard (9VAC25-260-310 m). The FELGs also address BOD₅ (16 mg/L monthly average and 26 mg/L daily max), however the Chickahominy standard is more stringent.

Total Suspended Solids (TSS): The TSS limitation is determined by the Chickahominy special standard (9VAC25-260-310 m). The FELGs also address TSS (20 mg/L monthly average and 30 mg/L daily max), however the Chickahominy standard is more stringent.

The Chesapeake Bay TMDL allocates loads for total suspended solids to protect the dissolved oxygen and submerged aquatic vegetation acreage criteria in the Chesapeake Bay and its tidal tributaries. The TSS allocations are considered aggregated and facilities with technology-based TSS limits are considered to be in conformance with the TMDL. This facility is subject to TSS limitations that are more stringent than the technology-based limitations required by the FELG, therefore the permit is in conformance with the TMDL requirement for TSS.

Settleable Solids: The settleable solids limitation is determined by the Chickahominy special standard (9VAC25-260-310 m).

Fecal Coliform: The fecal coliform limitation is required by the Federal Effluent Guidelines for Meat and Poultry Products Source Category (40 CFR 423). Specifically, subpart K (Poultry First Processing) applies to this facility and section 432.112 mandates that a maximum count 400 MPN per 100mL may be discharged at any time.

E. coli: The Chickahominy River and Tributaries Bacterial TMDL was approved by the EPA on 9/19/2012 and by the SWCB on 3/25/2013. Tyson received an *E. coli* wasteload allocation of 2.18E+12 cfu/year. An *E. coli* limitation is required for the permit to be in compliance with the TMDL.

In addition, in late 2010 the facility began using a UV disinfection system, discontinuing the use of chlorine for disinfection. Per the VDPE Permit Manual Section MN-2, a facility that utilizes alternate disinfection (not chlorination) with a design flow of 1.0 - 2.0 MGD requires bacteria monitoring five days per week between the hours of 10am and 4pm. For this reason the sampling frequency for *E. coli* is increased in the 2014 permit from once per week to 5 days per week.

Dissolved Oxygen (DO): The dissolved oxygen limitation is applied per section 9VAC25-260-185 of the state Water Quality Standards. The facility discharges to an area that has the Migratory Fish Spawning and Nursery Designated Use. This limitation is the same as that in the 2005 permit.

Ammonia-N: The Chickahominy Special Standards (9VAC25-260-310 m) require that ammonia-N not exceed a monthly average of 2.0 mg/L. The Federal Effluent Limitations Guidelines (FELG), 40 CFR 423.112 (Subpart K- Poultry First Processing) that apply to this facility also address ammonia -N, however the Chickahominy standard is more stringent than the 4.0 mg/L monthly average limitation

required by the FELG. The FELG also requires a 8.0 mg/L daily maximum limitation. A reasonable potential analysis for this parameter resulted in no limitation necessary to protect water quality. For this reason the Chickahominy monthly average of 2.0 mg/L and the FELG daily maximum of 8.0 mg/L are applied directly in the permit. These concentration limitations are the same as those in the 2005 permit.

The Chickahominy Special Standard and the FELG are both expressed to two significant figures. Since these documents determine the limitations, the load limits are also expressed to two significant figures.

Zinc: The permittee reported a dissolved zinc value less than the quantification level for the test method on the application. A reasonable potential analysis was performed using the existing limit for the data input and yielded the need for a limit based on acute toxicity. The limitation produced by Stats.exe was less stringent than that in the 2005 permit, therefore the zinc limitation is carried forward from the 2005 permit. Antibacksliding prohibits the relaxation of water quality based limitations.

Oil & Grease (O & G): Oil and grease is limited per the Federal Effluent Limitations Guidelines, 40 CFR 423.112 (Subpart K- Poultry First Processing) that apply to this facility.

Chlorides: The reasonable potential analysis indicated the need for a water quality based effluent (336 mg/L monthly average) limitation to protect against chronic toxicity. The analysis was run using a chloride concentration of 168.6 mg/L as reported on the 2010 application. This is a new limitation and as such a four year schedule of compliance is afforded. See permit Part I.D. for details. Interim monitoring is required before the limitation takes effect four years following the effective date of the permit.

Cadmium: The permittee reported an effluent cadmium concentration of less than 3.0 µg/L on the reissuance application. The agency accepted quantification limit for cadmium is 0.3 µg/L, therefore a reasonable potential analysis was performed with cadmium considered present at a concentration equal to the quantification level that the lab reported (3.0 µg/L). The reasonable potential analysis yielded a need for a 5.0 µg/L cadmium limitation based on chronic toxicity. The new limitation was rounded to two significant figures in accordance with GM 06-2016. This is a new limitation and as such a four year schedule of compliance is afforded. See permit Part I.D. for details. Interim monitoring is required before the limitation takes effect four years following the effective date of the permit.

Selenium: A selenium concentration of 89 µg/L was reported on the application in addition to a result of less than the quantification level of 2.0 µg/L. A reasonable potential analysis was performed using both the censored and uncensored data in accordance with Central Office guidance (A. Brockenbrough email, 1/29/2003) provided in Attachment F. The analysis resulted in the need for a limitation of 7.3 µg/L (rounded per GM 06-2016) to be protective of chronic toxicity. This is a new limitation and as such a four year schedule of compliance is afforded. See permit Part I.D. for details. Interim monitoring is required before the limitation takes effect four years following the effective date of the permit.

Toxicity: An in depth review of toxicity data was performed and is outlined in **Attachment H** – Whole Effluent Toxicity Evaluation. The need for a permit limit was identified and as such a new chronic toxicity limit of 1.38 TUc is applied in this permit. A four year schedule of compliance is afforded. See permit Part I.D. for details. Interim monitoring is required before the limitation takes effect four years following the effective date of the permit.

Nutrients:

Nutrient loads to the Chesapeake Bay watershed are now limited under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia (9VAC 25-820). The facility was issued coverage under this general permit (VAN040089) effective January 1, 2012. According to 9 VAC 25-820-30.A, the general permit shall control in lieu of conflicting or duplicative mass loading effluent limitations, monitoring or reporting requirements for total nitrogen and total phosphorus loads contained in individual VPDES permits for facilities covered by this general permit.

Per 9VAC 25-40-70 "Strategy for Chesapeake Bay Watershed," the board shall include technology-based effluent concentration limitations in the individual permit for any facility that has installed technology for nutrient control whether by construction, expansion, or upgrade. These limitations shall

be based on the technology installed by the facility and shall be expressed as annual average concentrations.

The Chesapeake Bay TMDL, administered via the General Permit (VAN040089) allots Tyson Foods-Glen Allen a TN wasteload allocation of 19,552 pounds per year and a TP wasteload allocation of 409 pounds per year. In the fall of 2008 (approved summer 2007) a tertiary filtration system was added to the treatment plant to address the Chesapeake Bay TMDL TP load allocation (409 pounds per year) which converts to an annual average concentration of 0.1 mg/L at the design flow of 1.07 MGD listed in the Registration List for the General Permit 9VAC 25-820-70 (the conversion is made using Equation 1 below). Per Section V. Expected Final Effluent Quality of the "Final Design Summary of Wastewater Treatment System Upgrade" document received by the department on 19 April 2007, the facility is designed to remove TP such that the final effluent shall have a concentration of no more than 0.10 mg/L. DEQ received a letter dated November 6, 2008 from Tyson, in which the owner certifies that the tertiary filter was installed in accordance with the design specifications previously submitted to DEQ. As such, a 0.1 mg/L TP technology-based concentration limit is applied as a calendar year average limitation in the 2014 permit per GM07-2008 Amendment 2. Monthly year-to-date monitoring is also required. The previously included TP load limits for parameter number 012 (TP) have been removed from the permit as these loads are now controlled by the General Permit (VAN040089).

The total phosphorus load generated by this facility is additionally addressed in the TMDL for the "Unnamed Tributary to the Chickahominy River" designed to address a benthic impairment (EPA approved 8/5/2004, DEQ approved 3/15/2005). The TMDL allocates Tyson a load 409.35 pounds per year of total phosphorus. In order for the individual permit to be in conformance with the TMDL a yearly maximum TP load must remain in the permit. The 2005 permit addressed the TMDL via a 186 kg/calendar year max TP load limitation (parameter code 794). This limit is carried forward in the 2014 permit.

Load (lbs/yr) = concentration (mg/L) X Flow (MGD) X 8.3438 (lbs/MG/mg/L) X 365 days/yr	Eqn (1)
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The wastewater treatment plant was also upgraded to provide higher efficiency total nitrogen removal to comply with the 19,552 pound per year nitrogen wasteload allocation listed in the General Permit (VAN040089). The former single stage activated sludge treatment plant was upgraded to a four stage Bardenpho biological nutrient removal (BNR) process followed by the tertiary filtration (discussed above). The facility's "Final Design Summary of Wastewater Treatment System Upgrade for High Efficiency Nitrogen Removal" dated June 18, 2008 was approved by DEQ on October 27, 2008. The BNR upgrade was completed in 2011. The BNR system was designed to remove TN to a concentration of 6.0 mg/L, and per the October 2008 approval letter this technology-based concentration limit is applied in the 2014 permit as a calendar year average limitation per GM07-2008 Amendment 2. Monthly year-to-date monitoring is also required. All previously included TN load limits have been removed from the permit as loads are now controlled by the General Permit (VAN040089).

The FELG for this facility also addresses Total Nitrogen (40 CFR 432.113) in the form of Best Available Technology (BAT). BAT applies to this facility because it slaughters more than 100 million pounds per year (max average 30-day production level of 16.33 million pounds per month or 195.6 million pounds per year). The TN BAT limitations are 147 mg/L daily maximum and 103 mg/L monthly average. These limitations were directly applied in the 2005, however, with the BNR upgrade the facility is capable of achieving far lower TN concentrations. Since the technology-based limitation of 6.0 mg/L monthly average is applied in this permit and is considerably more stringent than the FELG, the FELG limitation of 103 mg/L monthly average is no longer needed. The technology-based limit is protective of the FELG. Antibacksliding does not prevent the removal of this limitation because the new technology-based limit is more stringent. In addition, TN loads are now administered by General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia (9VAC 25-820). Based on the monthly average concentration limit, the max monthly average load that the facility may produce is 24 kg/d, far lower than the 487 kg/d monthly average load that was formerly limited by the permit per the FELG (conversion calculated using the 1.07 MGD design flow cited for this facility in the general permit registration list).

In addition to the General Permit and TMDL for the unnamed tributary to the Chickahominy, the facility is also subject to the Chickahominy special standards (9VAC25-260-310 m) which state that Tyson Foods, Inc. shall meet a 0.30 mg/L monthly average and 0.50 mg/L daily maximum TP limitation. This limitation was applied in both the 1999 and 2004 permits and is carried forward into the 2014 permit.

Total Residual Chlorine (TRC): Tyson installed ultraviolet (UV) disinfection equipment at the plant in late 2010. This disinfection system replaced chlorination as the mode of effluent disinfection, although the facility retained the infrastructure to chlorinate as a back-up, should the UV disinfection system fail at any time. Based on application Form 2C, TRC is believed absent in the effluent and was reported as <QL result on Attachment A. Since the facility is no longer using chlorine to disinfect its effluent and the parameter is believed absent in the wastewater, a TRC limit in Part I.A. is no longer needed. Anti-backsliding does not prevent the removal of this limit because material and substantial alterations to the facility were made. Since the facility has discontinued use of chlorination and installed a UV treatment system for the purpose of disinfection, chlorine is no longer purposefully introduced into the waste stream.

However, the facility retained the infrastructure for chlorination and dechlorination as a back-up to the UV disinfection system. Therefore, Part I.C.15 Additional TRC Limitations and Monitoring Requirements have been added to the permit. This special condition outlines effluent limitations and sampling frequencies that must be met should the facility switch to chlorination for any reason. To generate the limit a reasonable potential analysis was performed using a default input of 20,000 µg/L (refer to **Attachment F**).

Human Health Evaluation: Effluent cadmium, chloride, selenium, and zinc concentrations, as well as radionuclides, are displayed below in comparison to human health standards for illustrative purposes. Public water supply (PWS) human health standards do not directly apply to this facility because it does not discharge to a public water supply, however if it did, the discharge would not pose a threat to human health as shown below. Ammonia, TRC, and hydrogen sulfide are not displayed as a public health standard is not established for these parameters.

Human Health Evaluation

Parameter	Human Health Standard (PWS)	WLA _{HH, PWS}	Effluent Concentration	Exceed Human Health WLA?
Cadmium	5.0 µg/L	5.0 µg/L	< 3 µg/L	NO
Chlorides	250 mg/L	250 mg/L	168.6 mg/L	NO
Selenium, TR	170 µg/L	170µg/L	< 2 µg/L, 89 µg/L	NO
Zinc	7,400 µg/L	7,400 µg/L	190 µg/L	NO

Human Health Evaluation for radionuclides

Parameter	Human Health Standard	WLA _{HH, PWS}	Effluent Concentration	Exceed Human Health Standard?
Beta Particle & Photon Activity	4 mrem/yr	4 mrem/yr	46.3 +/- 1.7 pCi/L *	NO (see discussion below)
Uranium	30 µg/L	30 µg/L	0.00 +/- 0.00 pCi/L	NO
Gross Alpha	15 pCi/L	15 pCi/L	1.3 +/- 1.3 pCi/L	NO
Combined Radium 226 & 228	5 pCi/L	5 pCi/L	0.20 +/- 0.52 pCi/L	NO

* Note: See discussion below regarding unit conversions.

The permittee reported a detectable concentration (46.3 +/- 1.7 pCi/L) for Beta Particle & Photon Activity. It is noted that the Beta Particle & Photon Activity data reported on the application form is expressed in units of concentration (pCi/L) whereas the human health (PWS) criterion, 4 mrem/yr, is expressed in units of exposure. Virginia's Waterworks Regulations, 12VAC5-590-10 et seq., establish a primary maximum

contaminant level (PMCL) of 4 mrem/yr for Beta Particle & Photon Activity. The Waterworks Regulations also state, "When the detected level of beta/photon emitters has been reported in units of pCi/L and does not exceed 50 pCi/L, the [consumer confidence] report may list the PMCL as 50 pCi/L. EPA considers 50 pCi/L to be the level of concern for beta particles." Since the reported Beta Particle & Photon Activity data is in compliance with the Waterworks Regulations (below 50pCi/L), these radionuclides are not believed to be present at levels that pose a human health risk.

The application reported uranium in terms of activity, pCi/L, whereas the standard is in terms of a mass-based concentration, µg/L. EPA has suggested conversion factors for activity to mass ranging from 0.67 to 1.5 pCi/µg (USEPA 2000. National Primary Drinking Water Regulations; Final Rule 65 FR 236; December 7, 2000.). The uranium value reported was 0.00 +/- 0.00 pCi/L, which converts to 0 µg/L therefore there is no human health concern with regard to uranium.

As indicated in the table and discussion above, the radionuclides do not present a reasonable potential to cause or contribute to a water quality standard violation or present a human health concern.

b. Storm Water (Outfall 002):

Storm water discharges via Outfall 002 into the main conveyance channel out of the property. Here, storm water becomes comingled with treated effluent from the wastewater treatment plant. For compliance purposes the storm water discharge is sampled as it exits the storm water pond via Outfall 002 prior to mixing with the process wastewater. Per the application, 40% of the storm water that runs off of the property drains to the wastewater treatment plant, while the remainder is collected in the storm water pond and drainage network that feeds Outfall 002. See **Attachment J** for a storm water drainage map and Fact Sheet Item 9 for further details.

Guidance Memo 96-001 recommends that chemical-specific water quality-based limits not be placed on storm water outfalls at this time because the methodology for developing limits and the proper method of sampling is still a concern and under review/reevaluation by EPA. Therefore, in lieu of limitations, pollutants are assessed against screening criteria developed solely to identify those pollutants that should be given special emphasis during development and assessment of the Storm Water Pollution Prevention Plan (SWPPP). Exceptions would be where a VPDES permit for a storm water discharge has been issued that includes effluent limitations (backsliding must be considered before these limitations can be modified) and where there are reliable data, obtained using sound, scientifically defensible procedures, which provide the justification and defense for an effluent limitation.

Each screening criterion is established as the most stringent of either (1) two times the applicable pollutant's acute criterion, (2) the pollutants wasteload allocation, on the basis of the discharge going to a large receiving stream and utilizing conservative assumptions (i.e., Tier 2) or, where applicable, (3) the pollutant's benchmark monitoring concentration as contained in DEQ's VPDES general permit for stormwater associated with industrial activity. Any stormwater outfall effluent data submitted by the permittee that contained pollutants above the established screening criteria triggered the need for monitoring of that specific pollutant in Part I A of the permit for that outfall. The screening criteria are then utilized in the permit as a comparative value.

Parameters identified above the screening value are required by the permit to undergo a storm water management evaluation, to be monitored more frequently (quarterly) and potentially trigger a requirement for annual Whole Effluent Toxicity Testing. Benchmark values for the evaluated parameters are derived from those included for various industrial sectors in the Industrial Storm Water General Permit (VAR05) and may be helpful in identifying potential elevated pollutants, particularly when a screening value is not available. The maximum reported storm water value (drawn from Form 2F and DMR data 2010 - 2013) is utilized for the storm water evaluation. The data and screening criteria (if applicable) are shown below:

Table 2. Storm water screening results

Parameter	Max Value (Form 2F or DMR data)	Screening Value*	Benchmark Value	Exceeds Screening Value?	Exceeds Benchmark Value?
pH (min, max)	6.7 ,7.3 SU	6.0-9.0 SU	6.0-9.0 SU	No	No
BOD ₅	18.9 mg/L	NA	30 mg/L	NA	No
TSS	228 mg/L	NA	100 mg/L	NA	Yes
Fecal coliform	1600 N/cmL	28 N/cmL (two times the standard for shellfish waters)	NA	Yes	NA
Total Phosphorus	0.48 mg/L	NA	2.0 mg/L	NA	No
Ammonia- Nitrogen	1.04 mg/L	22.8 mg/L (based on max pH of 7.6 SU and trout present)	2.14	No	No
Oil & Grease	7.5 mg/L	NA	NA	NA	NA
Total Nitrogen	39.70 mg/L	NA	2.2 mg/L	NA	Yes
Chemical Oxygen Demand	88 mg/L	NA	120 mg/L	NA	No
TRC	< 10 µg/L	38 µg/L	NA	No	NA
TKN	2.45 mg/L	NA	1.5 mg/L	NA	Yes
Dissolved Oxygen	6.03 mg/L (average reported on Form 2F)	4.0 mg/L (daily minimum standard)	NA	Yes (In the case of DO, a value greater than the screening value is good)	NA

*Parameters with a screening value marked "NA" do not have an acute water quality standard on which to base the screening criteria.

Based on the data presented in Table 2, fecal coliform is the only parameter that exceeds the applicable screening value. From December 2010 through December 2013, the maximum fecal coliform reported on the DMR was 1600 N/cmL. The remainder of the data is all well above the screening value of 28 N/cmL with a count of 1,600 N/cmL being reported on multiple occasions. High fecal coliform counts in the storm water discharge appear to be a consistent problem at this outfall. This is of particular concern as Tyson discharges to a stream that has been listed for a bacteria impairment and Tyson was given an *E. coli* wasteload allocation in the Chickahominy River and Tributaries Bacterial TMDL (approved by the State Water Control Board on 3/25/2013 and EPA on 9/19/2012). Although the wasteload allocation applies to the process water discharge (Outfall 001), thought should be given to the high bacteria counts found in the storm water discharge and the ways in which it may be reduced.

The monitoring of fecal coliform in the storm water was included in the 1999 and 2005 permit based on permit writer judgement because of the FELG for the process water discharge which requires bacteria (in the form of fecal coliform) monitoring. The state water quality standard of 14 N/cmL fecal coliform is applicable in open ocean and estuarine waters capable of propagating shellfish. It is not applicable to freshwater which both Outfalls 002 and 001 discharge to. An *E. coli* bacteria standard of 126 N/cmL applies in freshwater. Given the applicable state water standard for the freshwater receiving stream, the storm water bacteria monitoring for Outfall 002 in the 2014 permit will be in the form of *E. coli*. This will better allow DEQ to determine whether the storm water discharge from the facility is in excess of the water quality standard and may be causing or contributing to the impairment in the receiving stream and Chickahominy River. A storm water management evaluation for bacteria is also required (refer to Part. I.B.1 of the permit).

TKN monitoring has historically been monitored at Outfall 002 based on best professional judgement. For this reissuance TN monitoring is deemed more relevant given the TN load allocation that is allocated to the facility and enforced via the General Permit (9VAC 25-820). TN is also addressed by the

FELG for this facility's process water. TKN monitoring is no longer required and is removed in lieu of TN monitoring.

Table 3. Basis for effluent Limitations: Outfall 002- Storm Water

EFFLUENT CHARACTERISTICS	BASIS	DISCHARGE LIMITS			MONITORING REQUIREMENTS	
		MONTHLY AVERAGE	DAILY MIN	DAILY MAX	FREQUENCY	SAMPLE TYPE
001 Flow (MG)	NA	NA	NA	NL	1 per 6 Months	Estimate
002 pH (Standard Units)	1	NA	NL	NL	1 per 6 Months	Grab
003 BOD ₅ (mg/L)	2, 3	NA	NA	NL	1 per 6 Months	Grab
004 Total Suspended Solids (mg/L)	2, 3	NA	NA	NL	1 per 6 Months	Grab
120 <i>E. coli</i> (MPN/100 mL)	1	NA	NA	NL	1 per Quarter	Grab
012 Total Phosphorus (mg/L)	3	NA	NA	NL	1 per 6 Months	Grab
039 Ammonia Nitrogen (mg/L)	2, 3	NA	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NA	NL	1 per 6 Months	Grab
500 Oil & Grease (mg/L)	2	NA	NA	NL	1 per 6 Months	Grab

(1) Permit writer judgement based on Water Quality Standards

(2) Permit writer judgement based on parameters that are addressed in the Federal Effluent Guidelines for the industry 40 CFR 423.112 (Subpart K- Poultry First Processing)

(3) Permit writer judgement based on the Chickahominy Special Standards (9VAC25-260-310 m) and Nutrient Regulations

17. Antibacksliding Statement: All limits are at least as stringent as the 2005 permit limitations.
18. Compliance Schedules: The 2014 permit includes new limitations for chlorides, cadmium, selenium and chronic toxicity (*C. dubia*). A four year schedule of compliance is afforded for the permittee to meet these limitations. Refer to Part I.D. of the permit. See **Attachment H** for the Whole Effluent Toxicity evaluation.

19. Special Conditions:

- Part I.B.1. Storm Water Management Evaluation;
- Part I.B.2. General Storm Water Conditions;
- Part I.B.3. Storm Water Pollution Prevention Plan; and
- Part I.B.4. Sector Specific SWPPP Requirements

Rationale: VPDES Permit Regulation, 9 VAC 25-31-10 defines discharges of storm water from industrial activity. 9 VAC 25-31-120 requires a permit for these discharges. The General Storm Water Special Conditions, Storm Water Pollution Prevention Plan requirements, and Benchmark Monitoring requirements of the permit are derived from the VPDES general permit for discharges of storm water associated with industrial activity (VAR05), 9 VAC 25-151-10 et seq. VPDES Permit Regulation, 9 VAC 25-31-220 K, requires use of best management practices where applicable to control or abate the discharge of pollutants when numerical effluent limits are infeasible or the practices are necessary to achieve effluent limits or to carry out the purpose and intent of the Clean Water Act and State Water Control Law. General storm water requirements, SWPPP requirements, and monitoring requirements have been included in accordance with the GM14-2003 Permit Manual, Section IN-4 and in accordance with the VAR05 Industrial Storm Water General Permit (9VAC25-151-10 et seq.).

Part I.C.1 **O&M Manual Requirement**

Rationale: Required by Code of Virginia § 62.1-44.16; VPDES Permit Regulation, 9 VAC 25-31-190 E, and 40 CFR 122.41(e). These require proper operation and maintenance of the permitted facility. Compliance with an approved O&M manual ensures this.

Part I.C.2 **Materials Handling and Storage**

Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia § 62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Part I.C.3 **Licensed Operator Requirement**

Rationale: The VPDES Permit Regulation, 9VAC25-31-200 C and the Code of Virginia § 54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.), require licensure of operators.

Part I.C.4 **Reopeners**

Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

9 VAC 25-40-70A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.

9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Part I.C.5 **Water Quality Criteria Reopener**

Rationale: VPDES Permit Regulation, 9VAC25-31-220D requires effluent limitations to be established which will contribute to the attainment or maintenance of water quality criteria.

Part I.C.6 **Notification Levels**

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 A for all manufacturing, commercial, mining, and silvicultural dischargers.

Part I.C.7

Compliance Reporting

Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Quantitation levels are as specified in Guidance Memorandum GM14-2003. The Total Recoverable Zinc QL is derived from the Site Specific Target Value (SSTV) calculated in MSTRANTI based on effluent and receiving stream conditions at the time of reissuance. Total Recoverable Zinc concentrations below the SSTV are not expected to be present in concentrations that will generate the need for a water quality limitation.

Part I.C.8

Groundwater Monitoring

Rationale: 9VAC25-280-20. Except where otherwise specified, ground water quality standards shall apply statewide and shall apply to all ground water occurring at and below the uppermost seasonal limits of the water table. In order to prevent the entry of pollutants into ground water occurring in any aquifer, a soil zone or alternate protective measure or device sufficient to preserve and protect present and anticipated uses of ground water shall be maintained at all times. 9VAC25-280-60 Ground water criteria, although not mandatory, also provide guidance in preventing ground water pollution. Also, State Water Control Law 62.1-44.21 authorizes the Board to request information needed to determinate the discharge's impact on State waters. Ground water monitoring for parameters of concern will indicate whether possible lagoon/pond seepage is resulting in violations to the State Water Control Board's Ground Water Standards.

A revised groundwater monitoring is required as part of the 2014 permit. During the course of the groundwater monitoring evaluation it was noted that certain parameters currently being monitored are consistently well below the applicable standard and are not present in statically significantly higher concentrations at the down-gradient wells as compared to the up-gradient well. The most recent action with regard to groundwater at this site was a 1992 approval of the Lagoon Closure Plan which required continued monitoring following the closure of the wastewater lagoons until natural attenuation has occurred. Groundwater monitoring may not be discontinued altogether, because certain parameters are present in the down-gradient wells at levels above the standard and contamination is apparent. However, given the groundwater monitoring plan is over 20 years old and some parameters appear to have attenuated, a revised groundwater plan designed for the current groundwater conditions is deemed suitable for the 2014 reissuance.

Part I.C.9

Closure Plan

Rationale: This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or is expected to close. This is necessary to ensure industrial sites and treatment works are properly closed so that the risk of untreated waste water discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section 62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law.

Part I.C.10

Industrial Concept Engineering Report (CER)

Rationale: §62.1-44.16 of the Code of Virginia requires industrial facilities to obtain DEQ approval for proposed discharges of industrial wastewater. A CER means a document setting forth preliminary concepts or basic information for the

design of industrial wastewater treatment facilities and the supporting calculations for sizing the treatment operations.

- Part I.C.11 **Nutrient Reporting Calculations**
Rationale: §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9 VAC 25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, this special condition is intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.
- Part I.C.12 **Suspension of Concentration Limits for E3/E4 Facilities**
Rationale: 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.
- Part I.C.13 **Hydrogen Sulfide Minimization Plan**
Rationale: VPDES Permit Regulation, 9VAC25-31-220.K, requires the use of best management practices (BMPs) where applicable to control or abate the discharge of pollutants where numeric effluent limitations are infeasible, or the practices are necessary to achieve effluent limitations or to carry out the purposes and intent of the State Water Control Law and the Clean Water Act.
- Part I.C.14 **Additional Chlorine Limitations and Monitoring Requirements**
Rationale: Required by Sewage Collection and Treatment Regulations 9VAC25-790 and Water Quality Standards 9VAC25-260-170, Bacteria; Recreational Waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.
- Part I.D. **Schedule of Compliance for Chlorides and Chronic Whole Effluent Toxicity**
Rationale: 9VAC 25-31-250 allows for schedules of compliance, when appropriate, which will lead to compliance with the Clean Water Act, the State Water Control Law and regulations promulgated under them.
- Part I.E.
Part I.F. **Whole Effluent Toxicity (WET) Limitation Requirements**
Whole Effluent Toxicity (WET) Monitoring Requirements
Rationale: VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.
- Refer to **Attachment H** for the Whole Effluent Toxicity Evaluation.
- Part II **Conditions Applicable to All Permits**
Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

20. NPDES Permit Rating Work Sheet: Total Score: 55 See **Attachment I**

21. Changes to Permit:

Note: "---" indicates no change from 2005 permit
"xx" indicates that this parameter/item was not included in the 2005 permit

Changes to Cover Page	
Changes	Reason
Format	Wording updated to reflect current agency guidance. CITY/COUNTY changed to COUNTY only.
Facility	Facility name updated per application. Per the application deficiency letter, the facility submitted a multimedia update form and the name change was made in CEDS on 20 September 2013.

Changes to Part I.A.1	
Changes	Reason
Format	Wording updated to reflect current agency guidance.

Outfall 001:

Changes	Effluent Limits		Monitoring Requirements		Reason
	From	To	From	To	
001 Flow (MGD)	---	---	---	---	No change
002 pH (SU)	---	---	---	---	No change
003 BOD ₅	28.4 kg/d monthly average	28 kg/d monthly average 38 kg/d daily max	---	---	Load revised to two significant figures to match the two significant figures of the concentration limit. The concentration limit is stipulated by 9VAC25-260-310m. Daily max load limits added per standard procedure. Load limits are calculated using the existing daily max concentration limit.
004 TSS	23.7 kg/d monthly average	24 kg/d monthly average 35 kg/d daily max	---	---	Load revised to two significant figures to match the two significant figures of the concentration limit. The concentration limit is stipulated by 9VAC25-260-310m. Daily max load limits added per standard procedure. Load limits are calculated using the existing daily max concentration limit.
005 TRC (µg/L)	7.97 µg/L monthly average 16.09 µg/L daily max	Limitation removed	1/Day	Limitation removed	In 2010 the facility terminated the use of chlorine for disinfection and began using UV disinfection. Since chlorine is no longer introduced into the waste water and it is believed absent, a TRC limit is no longer required. Antibacksliding does not prevent the removal of the limit because material and substantial alterations were made to the treatment work to change the disinfection method. TRC limitations are included in Part I.C.15 of the permit but are only activated if chlorination is used as an alternative to UV disinfection. Refer to Fact Sheet Item 16 for further details.

006 Fecal coliform (MPN/100mL)	---	---	---	---	Units updated from (#/100mL) to (MPN/100mL). No change to the limit or monitoring requirements.
007 Dissolved Oxygen (mg/L)	---	---	---	---	No change
120 <i>E. coli</i> (MPN/100mL)	---	---	1/Week	5 Days per Week (10am – 4pm)	Units updated from (#/100mL) to (MPN/100mL). Monitoring frequency updated in accordance with VPDES Permit Manual Section IN-2, Bacteria limits for alternate disinfection (ultraviolet).
012 Total Phosphorus (mg/L)	0.3 monthly average 0.5 daily max/ 1.4 kg/d monthly average 2.4 kg/d daily max	0.30 monthly average 0.50 daily max/ Loads removed	---	---	Concentration limitations updated to two significant figures to match 9VAC25-260-310 m. Chickahominy special standard. Load limits removed due to General Permit (9VAC 25-820) control in accordance with GM 07-2008 Amendment 2.
794 TP (calendar year average)	185 kg/yr	0.1 mg/L monthly average 185 kg/yr	1/Month	1/Year	Calendar year average concentration limitation added per GM 07-2008 Amendment 2 based on installed nutrient removal technology.
793 TP (kg/month)	NL kg/d daily max	Monitoring removed	1/Month	Monitoring removed	Parameter no longer needed. TP load limitations and monitoring requirements are accounted for in parameter 794 and 806.
806 TP (year-to-date)	NL kg/d daily max	NL kg/d daily max NL mg/L monthly average	---	---	Concentration monitoring inserted (in addition to continued load monitoring) per GM 07-2008 Amendment 2.
013 Total Nitrogen	103 mg/L, 487 kg/d monthly average 147 mg/L, 695 kg/d daily max	Limitations removed	2/Month	Limitations removed	The technology-based concentration limit applied as a calendar year average is considered protective of the FELG. TN load are now controlled by the General Permit (9VAC 25-820) in accordance with GM 07-2008 Amendment 2
039 Ammonia – N	37.9 kg/d daily max	38 kg/d daily max	---	---	Load revised to two significant figures to match the two significant figures of the concentration limit, stipulated by the FELG (40 CRF 423.112)
068 TKN	NL	Monitoring removed	2/Month	Monitoring removed	Monitoring requirement removed per GM07-2008 Amendment 2. Nutrient Enriched Waters (NEW) policy no longer applies and GM 05-2009 is superseded by GM07-2008 Amendment 2.

792 TN (calendar year average)	NL kg/D daily max	6.0 mg/L monthly average	---	---	Load monitoring removed due to General Permit (9VAC 25-820) control in accordance with GM 07-2008 Amendment 2. Technology-based concentration limit inserted per GM 07-2008 Amendment 2.
805 TN (year-to-date)	NL kg/d daily max	NL mg/L monthly average	---	---	Load monitoring removed due to General Permit (9VAC 25-820) control in accordance with GM 07-2008 Amendment 2. Concentration monitoring inserted per GM 07-2008 Amendment 2.
389 Nitrate plus Nitrite	NL mg/l NL kg/d monthly average	Monitoring removed	2/Month	Monitoring removed	Monitoring requirement removed per GM07-2008 Amendment 2. Nutrient Enriched Waters (NEW) policy no longer applies and GM 05-2009 is superseded by GM07-2008 Amendment 2.
791 TN (kg/month)	NL kg/d daily max	Monitoring removed	1/Month	Monitoring removed	Load monitoring removed due to General Permit (9VAC 25-820) control in accordance with GM 07-2008 Amendment 2.
071 Settleable solids	---	---	---	---	No change.
196 Zinc, total recoverable	---	---	---	---	No change.
795 Orthophosphate	NL mg/l NL kg/d monthly average	Monitoring removed	2/Month	Monitoring removed	Monitoring requirement removed per GM07-2008 Amendment 2. Nutrient Enriched Waters (NEW) policy no longer applies and GM 05-2009 is superseded by GM07-2008 Amendment 2.
801 Oil & Grease	37.8 kg/d monthly average 66.2 kg/d daily max	38 kg/d monthly average 66 kg/d daily max	---	---	Load revised to two significant figures to match the two significant figures of the concentration limit, stipulated by the FELG (40 CRF 423.112)
145 Chlorides (mg/L) (Interim)	xx	NL monthly average NL daily max	xx	1 per Month	Best professional judgement. Monitoring required prior to concentration limit becoming effective per the Schedule of Compliance (Part I.D.)
145 Chlorides (mg/L) (Final)	xx	340 mg/L monthly average 340 mg/L daily max	xx	1 per Month	Water quality based limit based on a reasonable potential analysis. Refer to permit Part I.D. for schedule of compliance.
202 Cadmium, Total Recoverable (µg/L) (Interim)	xx	NL monthly average NL daily max	xx	1 per Month	Best professional judgement. Monitoring required prior to concentration limit becoming effective per the Schedule of Compliance (Part I.D.)
202 Cadmium, Total Recoverable (µg/L) (Final)	xx	5.0 µg/L monthly average 5.0 µg/L daily max	xx	1 per Month	Water quality based limit based on a reasonable potential analysis. Refer to permit Part I.D. for schedule of compliance.

408 Selenium, Total Recoverable (µg/L) (Interim)	xx	NL monthly average NL daily max	xx	1 per Month	Best professional judgement. Monitoring required prior to concentration limit becoming effective per the Schedule of Compliance (Part I.D.)
408 Selenium, Total Recoverable (µg/L) (Final)	xx	7.3 µg/L monthly average 7.3 µg/L daily max	xx	1 per Month	Water quality based limit based on a reasonable potential analysis. Refer to permit Part I.D. for schedule of compliance.
720 Toxicity, Chronic <i>C. dubia</i> (Interim)	xx	NL (TU _c) daily max	xx	1 per Quarter	Best professional judgement. Monitoring required prior to concentration limit becoming effective per the Schedule of Compliance (Part I.D.)
720 Toxicity, Chronic <i>C. dubia</i> (Final)	xx	1.38 (TU _c) daily max	xx	1 per Quarter	Water quality based limit based on a reasonable potential analysis. See Attachment H for detailed evaluation.

Other Changes to Notes in Part I.A

NL footnote wording update.
NA footnote wording update.
24 HC footnote wording update.
8HC footnote removed. No longer needed.
HEM footnote wording update.
1 per Quarter and 1 per Year definitions added.

Footnote (2) TRC- updated to reflect the relocating of the TRC limit to Part I.C.15 Additional TRC Limitations and monitoring Requirement special condition.
Footnote (3) Citation for Schedule of Compliance updated to Part I.D.
Footnote (4) Special condition citations for Nutrient Reporting Requirements updated to Part I.C.11 and 12.
Footnote (6) Updated to cite Part I.F Whole Effluent Toxicity monitoring special condition. Two per month definition no longer applicable.
Footnote (7) Updated to cite Part I.E Whole Effluent Toxicity limit requirements special condition.
Footnote (9) Added per GM 07-2008 Amendment 2.
Footnote (10) Added to address significant figures per GM06-2016.

Note: "---" indicates no change from 2005 permit
xx" indicates that this parameter/item was not included in the 2005 permit

Changes to Part I.A.2	
Changes	Reason
Outfall 002 description	Updated to reflect the fact that the compliance point for storm water is before the WWTP effluent combines with storm water. Sample collected is storm water only.

Changes	Effluent Limits		Monitoring Requirements		Reason
	From	To	From	To	
001 Flow (MGD)	---	---	---	---	No change
002 pH (SU)	---	---	---	---	No change
003 BOD ₅ (mg/L)	---	---	---	---	No change
004 TSS (mg/L)	---	---	---	---	No change

006 Fecal coliform (MPN/100mL)	NL daily max	Monitoring removed	1/6Month	Monitoring removed	Fecal coliform monitoring was removed using Best professional Judgement. <i>E. coli</i> was deemed a more appropriate parameter to monitor because the standard for the receiving stream is in terms of <i>E. coli</i> . In addition the bacteria TMDL for the receiving stream is for <i>E. coli</i> .
120 <i>E. coli</i> (MPN/100mL)	xx	NL daily max	xx	1 per Quarter	See above for rationale for inserting <i>E. coli</i> monitoring. Also see fact sheet part 16 for greater explanation. Monitoring frequency for bacteria is increased to once per quarter due to historically high bacteria counts (well above the standard) in the storm water.
012 Total Phosphorus (mg/L)	---	---	---	---	No change
039 Ammonia Nitrogen (mg/L)	---	---	---	---	No change
068 TKN (mg/L)	NL daily max	Monitoring removed	1/6Month	Monitoring removed	TKN monitoring has historically been included based on best professional Judgement. For this reissuance TN monitoring is deemed more relevant given the TN load allocation that is allocated to the facility and enforced via the General Permit (9VAC 25-820). TKN monitoring is no longer deemed necessary and is removed in lieu of TN monitoring.
013 Total Nitrogen (mg/L)	xx	NL daily max	xx	1 per 6 Months	See above rational for inserting TN based on Best Professional Judgement. Also see fact sheet part 16 for greater explanation.
500 Oil and Grease	---	---	---	---	No change

Other Changes to Notes in Part I.A.2

Footnote changes to Part I.A.2.a

NL footnote wording update.

NA footnote wording update.

Estimate footnote added to provide definition.

1 per 6 Months definition added.

1 per Quarter definition added.

Part I.A.2.c. Footnote updated up cite Part I.B. for additional requirements.

Part I.A.2.d. Wording updates and compliance point for Outfall 002 clarified.

Part I.A.2.e. Footnote added per VPDES Permit Manual section IN-4

* footnote removed. Definition of estimate provided in Part I.A.2.a.

** footnote removed as it is no longer a requirement per current agency guidance (GM 10-2003 VPDES Permit Manual section IN-4)

Changes to Conditions:		
From	To	Rationale
Part I.B. General Storm Water Management	Part I.B.2 General Storm Water Special Conditions	Section renumbered due to addition of Storm Water Management Evaluation (Part I.B.1 in 2014 permit). Language updates per GM 14-2003 VPDES Permit Manual and the 2014 VPDES Industrial Stormwater General Permit Regulation (9VAC- 25-151).
Part I.B.1 Sample Type	Part I.B.1 Storm Water Management Evaluation	Storm water management evaluation added per GM 14-2003 VPDES Permit Manual due to historically high bacteria counts in the storm water. See also Fact Sheet section 16 for further discussion and rationale.
Part I.C. SWPPP	Part I.B.3 SWPPP	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual.
Part I.C.6 Sector-Specific SWPPP Requirements	Part I.B.4 Sector-Specific SWPPP Requirements	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual.
Part I.D.1. O & M Manual Requirement	Part I.C.1 O & M Manual Requirement	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual.
Part I.D.2. Materials Handling/Storage	Part I.C.2 Material Handling and Storage	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual.
Part I.D.3. Licensed Operator Requirement	Part I.C.3. Licensed Operator Requirement	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual
Part I.D.4. Nutrient Enriched Waters/ Chesapeake Bay Nutrients Reopener	Part I.C.4. Reopeners	Reopeners added and language updated per GM 07-2008 Amendment 2.
Part I.D.5 Water Quality Criteria Reopener	Part I.C.5 Water Quality Criteria Reopener	Section renumbered
Part I.D.6 Notification Levels	Part I.C.6 Notification Levels	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual.
Part I.D.7 Compliance Reporting under Part I.A.	Part I.C.7 Compliance Reporting	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual.
Part I.D.8 Groundwater Monitoring	Part I.C.8 Groundwater Monitoring	Section renumbered and wording updated per GM 14-2003 to reflect requirement to submit a new Groundwater Monitoring Plan upon permit reissuance. See also Attachment G for Groundwater Evaluation and further discussion.
Part I.D.9 TMDL Reopener	Part I.C.9 Closure Plan	TMDL reopener bundled under Reopeners special condition (Part I.C.4 in 2014 permit). Closure plan added per GM14-2003 VDPES Permit Manual.
Part I.D.10 General Permit Controls	Part I.C.10 Industrial Concept Engineering Report (CER)	General Permit Controls special condition no longer applicable (the facility is covered under the general permit VAN040089). CER special condition added per GM 14-2003 VPDES Permit Manual.
Part I.D.11. Nutrient Reporting Calculations	Part I.C.11. Nutrient Reporting Calculations	Section renumbered and language updated per GM 14-2003 VPDES Permit Manual and GM 07-2008 Amendment 2.
Part I.D.12 Basis of Design Report for Nutrient Removal	Part I.C.12 Suspension of Concentration Limits for E3/E4 Facilities	Basis of Design Report for Nutrient Removal special condition no longer applicable. Suspension of Concentration Limits for E3/E4 Facilities added per GM 14-2003 VPDES Permit Manual.

Part I.D.13 Interim Optimization Plan for Nutrient Removal	Part I.C.13 Hydrogen Sulfide Minimization Plan	Interim Optimization Plan for Nutrient Removal special condition no longer applicable. Hydrogen Sulfide Minimization Plan special condition added due to hydrogen sulfide data reported on the application per GM 14-2003 VPDES Permit Manual.
xx	Part I.C.14 Additional Chlorine Limitations and Monitoring Requirements	Added per GM 14-2003 VPDES Permit Manual A UV disinfection system was brought online in 2010 and chlorine disinfection was discontinued. However, the facility retained the infrastructure to chlorinate should the UV system ever fail. This special condition addresses the TRC monitoring requirements and limitation should the facility ever choose chlorination for their disinfection method.
Part I.D.14 Schedule of Compliance for <i>E. coli</i> and Zinc Limits	Part I.D Schedule of Compliance for Chlorides, Cadmium and Chronic Whole Effluent Toxicity	Section renumbered and updated to reflect compliance schedules for limits new to the 2014 permit. Language updates per GM 14-2003 VPDES Permit Manual.
Part I.E. WET Testing	Part I.E. WET Limitation Requirements	Section updated to reflect new WET limitations per the WET Evaluation and reasonable potential analysis (see Attachment H). Language approved 12/10/2010 by Central Office (D. DeBiasi)
xx	Part I.F. WET Monitoring Requirements	Section added to reflect new WET limitations and monitoring requirements per the WET Evaluation and reasonable potential analysis (see Attachment H). Language approved 12/10/2010 by Central Office (D. DeBiasi)
Part II Conditions Applicable to all VPDES Permits	Part II Conditions Applicable to all VPDES Permits	Section updated per GM 14-2003 VPDES Permit Manual.

"xx" indicates that this special condition was not included in the 2005 permit

22. Variances/Alternate Limits or Conditions: None

23. Public Notice Information required by 9 VAC 25-31-280 B:

Publication Dates: **TBD** and **TBD**

Comment period:

Start Date:

End Date:

Publication in: *Style Weekly*

All pertinent information is on file and may be inspected, and copied by contacting Janine Howard at:

VDEQ – Central Office

629 E. Main Street

Richmond, VA 23218

Telephone No. (804) 698-4299

E-mail address: Janine.howard@deq.virginia.gov

DEQ accepts comments and requests for public hearing by hand delivery, e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit. The public may review the draft permit and

application at the DEQ Piedmont Regional Office by appointment or may request copies of the documents from the contact person listed above.

24. Additional Comments:

Previous Board Action: The facility was issued a Special Order by Consent on March 16, 2006. The Consent Order resulted from a series of issues that occurred in August 2005 including fish kills, failure of the dissolved air flotation unit, low dissolved oxygen (less than 1.0 mg/L) in the receiving stream and numerous effluent limit violations on the August 2005 DMR (BOD₅, TSS, TP, and ammonia-N). A Notice of Violation (NOV) was issued on November 5, 2005 citing the two fish kills and effluent violations. As a result of the Consent Order the 2005 permit was modified in 2006 to increase monitoring of BOD₅, TSS, TP, and ammonia-N from once per week to three times per week. The Order has since been closed.

The facility was issued another Special Order by Consent on August 24, 2009. The Consent Order resulted from a fish kill reported on December 4, 2008 in an unnamed tributary downstream of the plant. The fish kill was determined to be caused by a dissolved oxygen sag that resulted from the overdosing of sodium bisulfate during dechlorination. The overdosing resulted in the effluent having an elevated chemical oxygen demand. A NOV was issued for the fish kill on March 13, 2009. As part of the Consent Order the facility agreed to a Supplemental Environmental Project (SEP). Ultimately the storm water bioretention basin was installed as part of the SEP (refer to Fact Sheet Item 9 for more details). As of May 2014 the Order is still active.

Reduced Monitoring: The facility does not qualify for reduced monitoring as it has received Warning Letters within the last three years (dated 10/29/2010, 12/30/2010, and 9/29/2011). Per section IN-2 of the VPDES Permit Manual (GM 14-2003) facilities are only eligible for reduced monitoring if they have not received any enforcement related documents during the last three years.

VDH comments: VDH provided the following comment by memorandum dated November 18, 2010: "There are no public water supply intakes within 15 miles downstream of the discharge/activity."

Other Agency Comments: None

Fees: Annual maintenance fees are up to date and were deposited on 27 September 2013.

E-DMR Participation: This permittee has been enrolled in E-DMR since 5/8/2007.

Virginia Environmental Excellence Program (VEEP): The facility is not enrolled in VEEP.

Controversial Project / Permit: No

EPA Comments: TBD

Owner Comments: TBD

Public Comment: TBD

Locality Notification: In accordance §62.1-44.15:01.A.2, 9 VAC25-31-290.G.2 and GM11-2005, the County of Hanover (Board of Supervisors Chair and County Administrator) and the Richmond Regional Planning District Commission were notified of the public comment period and sent the legal notice for the draft permit in a letter dated TBD.

Planning Conformance Statement: Per a memo dated 5/29/2014, Water Resources Planning staff certified that the discharge is in conformance with the existing planning documents for the area.

25. 303(d) Listed Segments (TMDL):

Per the 2012 305(b)/303(d) Water Quality Assessment, the tributary below Tyson is considered a Category 5D water ("The Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.") The applicable fact sheets are included in **Attachment A**. The stream was considered impaired of the Aquatic Life Use due to ammonia and pH exceedances, an impaired benthic community, and low dissolved oxygen. The Wildlife Use was impaired due to the ammonia exceedances, the Fish Consumption Use was considered fully supporting with observed effects due to a VDH fish advisory for kepone, and the Recreation Use was not assessed.

Tyson was addressed in the report "Total Maximum Daily Load (TMDL) Development for the Unnamed Tributary to the Chickahominy River" which was approved by the EPA on 8/5/2004 and by the SWCB on 3/15/2005. The facility received a total phosphorus wasteload allocation of 409.35 lbs/year. The 2014 permit contains a monthly TP load maximum of 15.4 kg/d (parameter code 793). The monthly maximum converts to a yearly maximum load of 185 kg/year or 407 lbs/year. This limit is therefore protective of the 409.35 lbs/year load allocation designated in the TMDL (see Fact Sheet Item 16- Nutrients for further discussion).

The Chickahominy River and Tributaries Bacterial TMDL was approved by the EPA on 9/19/2012 and by the SWCB on 3/25/2013. Tyson received an *E. coli* wasteload allocation of 2.18E+12 cfu/year. The 2014 permit has a monthly average limitation of 126 MPN/100mL for *E. coli* that requires compliance with the standard prior to discharge; compliance with the limitation ensures compliance with the TMDL.

This facility discharges directly to an unnamed tributary of the Chickahominy River in the Chesapeake Bay watershed in the Chickahominy River estuary segment (CHKOH). The receiving stream has been addressed in the Chesapeake Bay TMDL, approved by EPA on December 29, 2010. The TMDL addresses dissolved oxygen (DO), chlorophyll a, and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tidal tributaries by establishing non-point source load allocations (LAs) and point-source waste load allocations (WLAs) for Total Nitrogen (TN), Total Phosphorus (TP) and Total Suspended Solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185. This facility is considered a Significant Chesapeake Bay wastewater discharge. All Significant Chesapeake Bay wastewater discharges in the Chickahominy River estuary segment (CHKOH) have been assigned aggregate WLAs of 46,371 pounds per year TN, 19,822 pounds per year TP, and 939,747 pounds per year TSS.

Implementation of the Chesapeake Bay TMDL is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP), approved by EPA on December 29, 2010. The approved WIP recognizes that the TMDL nutrient WLAs for Significant Chesapeake Bay wastewater dischargers are set in two regulations: 1) the Water Quality Management Planning Regulation (9VAC25-720); and 2) the "General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia" (9VAC25-820). The WIP further outlines that since TSS discharges from wastewater facilities represent an insignificant portion of the Bay's total sediment load, they may be considered in the aggregate. The WIP also states that wastewater discharges with technology-based TSS limits are considered consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written with effluent limits necessary to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. DEQ has provided coverage under the VPDES Nutrient General Permit (GP) for this facility under permit VAN40089. The requirements of the Nutrient GP currently in effect for this facility are consistent with the Chesapeake Bay TMDL. This individual permit includes TSS limits of 5.0 mg/L monthly average that are more stringent than the technology-based requirements and therefore consistent with the Chesapeake Bay TMDL and WIP. In addition, the individual permit has limits of 6.0 mg/L monthly average BOD₅, and 5.0 mg/L monthly average DO which provide protection of instream DO concentrations to at least 5.0 mg/L. However, implementation of the full Chesapeake Bay WIP, including GP reductions combined with actions proposed in other source sectors, is expected to adequately address ambient conditions such that the proposed effluent limits of this individual permit

are consistent with the Chesapeake Bay TMDL, and will not cause an impairment or observed violation of the standards for DO, chlorophyll a, or SAV as required by 9VAC25-260-185.

26. Attachments:

Attachment A:	Flow Frequency Memo and Fact Sheets for 303(d) Waters
Attachment B:	Site Diagram and Location Map
Attachment C:	Site Inspection Report
Attachment D:	Federal Effluent Limitation Guidelines 40CFR 423 (Subpart K)
Attachment E:	Facility Effluent Data (Water Quality Criteria Monitoring and Application Data)
Attachment F:	MSTRANTI and Stats.exe
Attachment G:	Groundwater Evaluation and Memo
Attachment H:	Whole Effluent Toxicity Evaluation
Attachment I:	NPDES Industrial Permit Rating Work Sheet
Attachment J:	Storm Water Drainage Map and Drainage Notes
Attachment K:	Storm Water Data

**Attachment A: Flow Frequency Memo and
Fact Sheets for 303(d) Waters**

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Tyson Foods, Inc. – VA0004031

TO: Janine Howard

FROM: Jennifer Palmore, P.G.

DATE: January 28, 2014

COPIES: File

The Tyson Foods, Inc. – Glen Allen facility discharges to an unnamed tributary of the Chickahominy River in Hanover County. The river miles for outfalls 001 and 002 are 2-XDD001.12 and 2-XDD000.95, respectively. Flow frequencies have been requested for use in developing effluent limitations for the VPDES permit.

At the discharge point, the receiving stream is shown to be an intermittent stream on the USGS Glen Allen 7 ½' Quadrangle topographic map. The flow frequencies for intermittent tributaries are listed below:

Unnamed tributary at Outfalls 001 and 002:

1Q30 = 0.0 MGD	High Flow 1Q10 = 0.0 MGD
1Q10 = 0.0 MGD	High Flow 7Q10 = 0.0 MGD
7Q10 = 0.0 MGD	High Flow 30Q10 = 0.0 MGD
30Q10 = 0.0 MGD	HM = 0.0 MGD
30Q5 = 0.0 MGD	

Due to its intermittent nature, the receiving stream is considered a Tier 1 water. Effluent data should be used to characterize the stream during low flow conditions.

During the 2012 305(b)/303(d) Water Quality Assessment, the tributary below Tyson is considered a Category 5D water ("The Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.") The applicable fact sheets are attached. The stream was considered impaired of the Aquatic Life Use due to ammonia and pH exceedances, impaired benthic community, and low dissolved oxygen. The Wildlife Use was impaired due to the ammonia exceedances, the Fish Consumption Use was considered fully supporting with observed effects due to a VDH fish advisory for kepone, and the Recreation Use was not assessed.

Tyson was addressed in the report "Total Maximum Daily Load (TMDL) Development for the Unnamed Tributary to the Chickahominy River" which was approved by the EPA on 8/5/2004 and by the SWCB on 3/15/2005. The facility received a total phosphorus wasteload allocation of 409.35 lbs/year.

The Chickahominy River and Tributaries Bacterial TMDL was approved by the EPA on 9/19/2012 and by the SWCB on 3/25/2013. Tyson received an E. coli wasteload allocation of 2.18E+12 cfu/year.

The discharge was also addressed in the Chesapeake Bay TMDL, which was approved by the EPA on 12/29/2010. The TMDL allocates loads for total nitrogen, total phosphorus, and total suspended solids to protect the dissolved oxygen and submerged aquatic vegetation acreage criteria in the Chesapeake Bay and its tidal tributaries. Tyson Foods is considered a significant nutrient discharger and was included in the aggregated loads for significant wastewater dischargers in the Chickahominy River estuary (CHKOH).

The nutrient allocations are administered through the Watershed Nutrient General Permit; the TSS allocations are considered aggregated and facilities with technology-based TSS limits are considered to be in conformance with the TMDL.

If you have any questions concerning this analysis, please let me know.

2012 Fact Sheets for 303(d) Waters

RIVER BASIN:	James River Basin	HYDROLOGIC UNIT:	02080206
STREAM NAME:	Chickahominy River, UT - Unnamed Tributary		
TMDL ID:	G05R-01-BEN	2012 IMPAIRED AREA ID:	VAP-G05R-01
ASSESSMENT CATEGORY:	4A	TMDL DUE DATE:	2004
IMPAIRED SIZE:	1.15 - Miles	Watershed:	VAP-G05R
INITIAL LISTING:	1994		
UPSTREAM LIMIT:	Tyson Plant discharge		
DOWNSTREAM LIMIT:	Chickahominy River confluence		

Segment consists of the unnamed tributary of the Chickahominy River to which the Tyson Plant discharges.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting

IMPAIRMENT: General Standard (Benthic), pH

Biological monitoring of the receiving stream identified a moderately impaired benthic community downstream of the Tyson Plant (VPDES Permit No. VA0004031) discharge when compared to the benthic community immediately upstream of the discharge. This resulted in this segment being assessed as impaired of the Clean Water Act's Aquatic Life Use Support Goal for the 1994 305(b) report. Continued monitoring resulted in a similar assessment for the 1996, 1998, 2002, and 2004 reports.

The TMDL study for the watershed was completed during the 2006 cycle. Extensive biological and nutrient monitoring was conducted. The benthic impairment continued and a pH impairment was noted at stations 2-XDD000.32 and 2-XDD000.40. The past phosphorus screening value was exceeded at multiple stations. The chlorophyll A screening was exceeded at 2-XDD000.40 and 2-XDD000.32 as well.

The TMDL was approved by the EPA on 8/05/2004 and by the SWCB on 3/15/05. The study attributed the benthic impairment to excess phosphorus and high pH. The allocation was 432.69 lbs/year of phosphorus, divided between Tysons Foods (409.35 lbs/yr) and nonpoint sources (23.34 lbs/year).

The segment remained impaired for benthics as well as pH during the 2012 cycle with an exceedance rate of 55/96 at 2-XDD000.40. and 50/99 at 2-XDD000.32.

IMPAIRMENT SOURCE: Industrial Point Source, Nonpoint Source

The source of the impairment was attributed to excessive nutrient overenrichment.

RECOMMENDATION: Implementation

2012 Fact Sheets for 303(d) Waters

RIVER BASIN:	James River Basin	HYDROLOGIC UNIT:	02080206
STREAM NAME:	Chickahominy River, UT - Unnamed Tributary		
TMDL ID:	G05R-01-DO	2012 IMPAIRED AREA ID:	VAP-G05R-01
ASSESSMENT CATEGORY:	5A	TMDL DUE DATE:	2020
IMPAIRED SIZE:	1.15 - Miles	Watershed:	VAP-G05R
INITIAL LISTING:	2008		
UPSTREAM LIMIT:	Tyson Plant discharge		
DOWNSTREAM LIMIT:	Chickahominy River confluence		

Segment consists of the unnamed tributary of the Chickahominy River to which the Tyson Plant discharges.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting

IMPAIRMENT: Dissolved Oxygen

The segment was assessed as not supporting of the Aquatic Life Use for dissolved oxygen due to an exceedance rate of 2/2 at 2-XDD000.65. Other stations in the segment have acceptable violation rates, therefore continued monitoring is recommended.

IMPAIRMENT SOURCE: Industrial Point Source

The source of the impairment is believed to be the Tysons Plant discharge.

RECOMMENDATION: Continue Monitoring

2012 Fact Sheets for 303(d) Waters

RIVER BASIN:	James River Basin	HYDROLOGIC UNIT:	02080206
STREAM NAME:	Chickahominy River, UT - Unnamed Tributary		
TMDL ID:	G05R-01-NH3	2012 IMPAIRED AREA ID:	VAP-G05R-01
ASSESSMENT CATEGORY:	5A	TMDL DUE DATE:	2020
IMPAIRED SIZE:	1.15 - Miles	Watershed:	VAP-G05R
INITIAL LISTING:	2008		
UPSTREAM LIMIT:	Tyson Plant discharge		
DOWNSTREAM LIMIT:	Chickahominy River confluence		

Segment consists of the unnamed tributary of the Chickahominy River to which the Tyson Plant discharges.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting, Wildlife Use - Not Supporting

IMPAIRMENT: Ammonia

Multiple exceedances of the chronic ammonia criteria had been noted in grab samples throughout the stream, therefore a special study was conducted in July 2005 to investigate the ammonia levels in the stream. Based on the results of the study, the segment is now impaired for ammonia because of 6 acute ammonia exceedances each at 2-XDD000.84 and at 2-XDD000.91. A fish kill was noted in the pond.

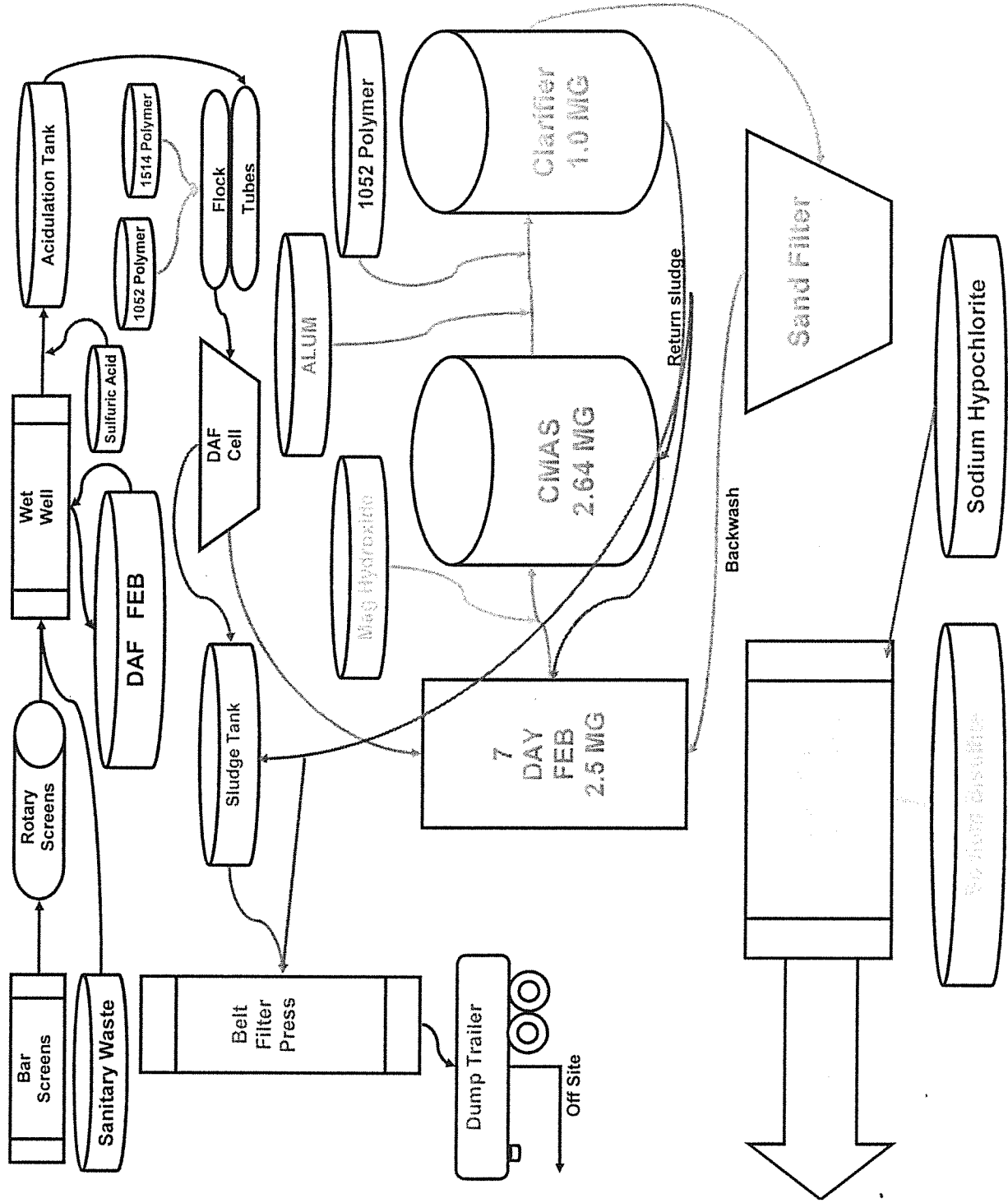
IMPAIRMENT SOURCE: Industrial Point Source

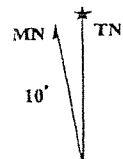
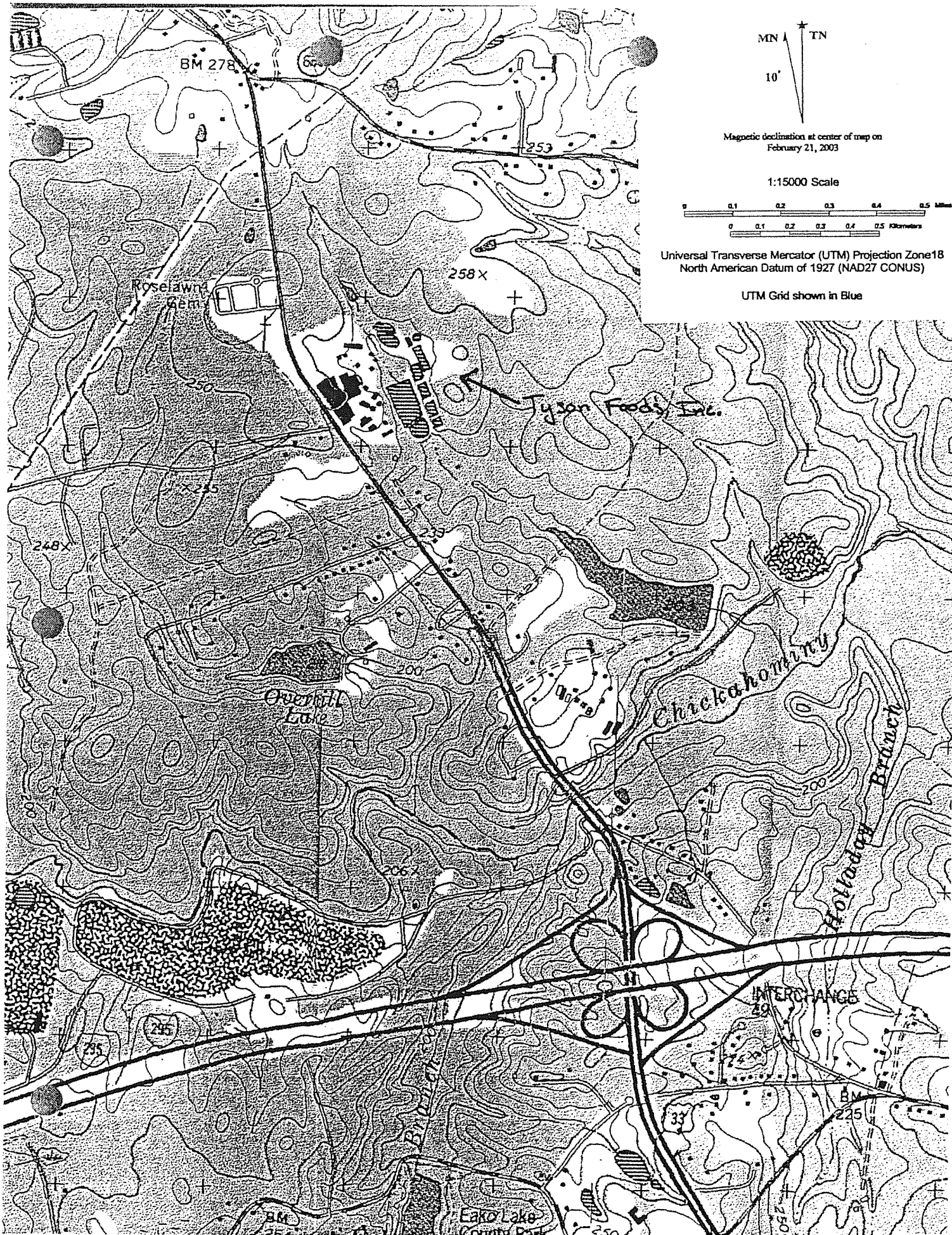
The source of the impairment is believed to be the Tysons Plant discharge.

RECOMMENDATION: Problem Characterization

Attachment B: Site Diagram and Location Map

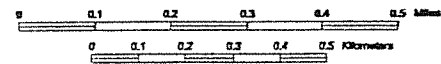
WWTP Process Flow





Magnetic declination at center of map on February 21, 2003

1:15000 Scale



Universal Transverse Mercator (UTM) Projection Zone 18
North American Datum of 1927 (NAD27 CONUS)

UTM Grid shown in Blue

Attachment C: Site Inspection Report

Wastewater Facility Inspection Report

Virginia Department of Environmental Quality

TECHNICAL INSPECTION REPORT

FACILITY NAME: Tyson Foods, Inc.		INSPECTION DATE: August 30, 2013	
PERMIT No.: VA0004031		INSPECTOR: Shawn Weimer	
TYPE OF FACILITY: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div> <input type="checkbox"/> Municipal <input type="checkbox"/> Major </div> <div> <input checked="" type="checkbox"/> Industrial <input checked="" type="checkbox"/> Minor </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div> <input type="checkbox"/> Federal <input type="checkbox"/> Small Minor </div> <div> <input type="checkbox"/> HP <input type="checkbox"/> LP </div> </div>		REPORT DATE: October 3, 2013	
		TIME OF INSPECTION: <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="text-align: center;">0913 Arrival</div> <div style="text-align: center;">1330 Departure</div> </div>	
		TOTAL TIME SPENT (including prep & travel) <div style="text-align: center; margin-top: 5px;">28 hours</div>	
PHOTOGRAPHS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		UNANNOUNCED INSPECTION? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
REVIEWED BY / Date:			
PRESENT DURING INSPECTION: Austin French and Tim Lockhart			

TECHNICAL INSPECTION

1. Has there been any new construction? • If so, were plans and specifications approved? <u>Comments:</u> Upgrade from a single stage activated sludge treatment system to a four stage Bardenpho BNR process along with the addition of a UV disinfection system.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. Is the Operations and Maintenance Manual approved and up-to-date? <u>Comments:</u> An O&M manual dated August 7, 2012 was reviewed as part of this inspection.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Are the Permit and/or Operation and Maintenance Manual specified licensed operator being met? <u>Comments:</u> 1 class I operator; three employees are working on obtaining their class IV license.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. Are the Permit and/or Operation and Maintenance Manual specified operator staffing requirements being met? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Is there an established and adequate program for training personnel? <u>Comments:</u> Training includes: DEQ's operator training books, Sacramento operator training books, and licensing prep classes at John Tyler CC.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. Are preventive maintenance task schedules being met? <u>Comments:</u> Minor maintenance is performed by plant personnel and more complex repairs (e.g. rebuilding a pump) are performed by contractors.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7. Does the plant experience any organic or hydraulic overloading? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
8. Have there been any bypassing or overflows since the last inspection? <u>Comments:</u> On August 10, 2012, the facility received heavy rainfall which caused an overflow in their sanitary wet well. An estimated 300 to 500 gallons was reported to have reached the wastewater effluent creek which discharges into a UT of the Chickahominy River. After investigating the incident, weekend pump settings were modified so that flows in the wet wells could be properly controlled during incidents of heavy rainfall.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Wastewater Facility Inspection Report

<p>9. Is the standby generator (including power transfer switch) operational and exercised regularly? <u>Comments:</u></p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>10. Is the plant alarm system operational and tested regularly? <u>Comments:</u></p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>11. Is sludge disposed of in accordance with the approved sludge management plan? <u>Comments:</u> Sludge from the belt press is transported to an off-site composting facility.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>12. Is septage received? • If so, is septage loading controlled, and are appropriate records maintained? <u>Comments:</u></p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>13. Are all plant records (operational logs, equipment maintenance, industrial waste contributors, sampling and testing) available for review and are records adequate? <u>Comments:</u></p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>14. Which of the following records does the plant maintain?</p> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Operational logs <input checked="" type="checkbox"/> Instrument maintenance & calibration </div> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Mechanical equipment maintenance <input type="checkbox"/> Industrial Waste Contribution (Municipal facilities) </div> <p><u>Comments:</u></p>	
<p>15. What does the operational log contain?</p> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Visual observations <input checked="" type="checkbox"/> Flow Measurement <input checked="" type="checkbox"/> Laboratory results <input checked="" type="checkbox"/> Process adjustments </div> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Control calculations <input type="checkbox"/> Other (specify) </div> <p><u>Comments:</u></p>	
<p>16. What do the mechanical equipment records contain?</p> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> As built plans and specs <input checked="" type="checkbox"/> Manufacturers instructions <input checked="" type="checkbox"/> Lubrication schedules </div> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Spare parts inventory <input checked="" type="checkbox"/> Equipment/parts suppliers </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Other (specify) </div> <p><u>Comments:</u></p>	
<p>17. What do the industrial waste contribution records contain (Municipal only)?</p> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Waste characteristics <input type="checkbox"/> Impact on plant <input type="checkbox"/> Locations and discharge types </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Other (specify) </div> <p><u>Comments:</u> Not Applicable</p>	
<p>18. Which of the following records are kept at the plant and available to personnel?</p> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Equipment maintenance records <input checked="" type="checkbox"/> Operational log <input type="checkbox"/> Industrial contributor records </div> <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Instrumentation records <input checked="" type="checkbox"/> Sampling and testing records </div> <p><u>Comments:</u></p>	
<p>19. List records not normally available to plant personnel and their location: <u>Comments:</u> None</p>	
<p>20. Are the records maintained for the required time period (three or five years)? <u>Comments:</u></p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS EVALUATION SUMMARY SHEET

UNIT PROCESS	APPLICABLE	PROBLEMS*	COMMENTS
Sewage Pumping	X		
Flow Measurement (Influent)	X		
Screening/Comminution	X		
Grit Removal			
Oil Skimmer			
Flow Equalization	X		Anoxic Reactor #1 (7-Day FEB)
Ponds/Lagoons	X		Out of service
Imhoff Tank			
Primary Sedimentation			
Trickling Filter			
Septic Tank and Sand Filter			
Rotating Biological Contactor			
Activated Sludge Aeration	X		Four stage Bardenpho BNR process with CMAS
Biological Nutrient Removal			
Sequencing Batch Reactor			
Secondary Sedimentation	X	1,3	Repairs to the clarifier were not completed as of October 2, 2013.
Flocculation			
Tertiary Sedimentation			
Filtration	X		Sand filters
Micro-Screening			
Activated Carbon Adsorption			
Chlorination			
Dechlorination			
Ozonation			
Ultraviolet Disinfection	X		
Post Aeration	X		
Flow Measurement (Effluent)	X		
Land Application (Effluent)			
Plant Outfall	X		
Sludge Pumping	X		
Flotation Thickening (DAF)	X		
Gravity Belt Thickening			
Aerobic Digestion			
Anaerobic Digestion			
Lime Stabilization			
Centrifugation			
Sludge Press	X	1	Belt press was not operational due to mechanical problems
Vacuum Filtration			
Drying Beds			
Thermal Treatment			
Incineration			
Composting			
Land Application (Sludge)			

* Problem Codes

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Unit Needs Attention 2. Abnormal Influent/Effluent 3. Evidence of Equipment Failure | <ol style="list-style-type: none"> 4. Unapproved Modification or Temporary Repair 5. Evidence of Process Upset 6. Other (explain in comments) |
|--|--|

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Screening/Comminution

1. Number of units: Manual: 0 Mechanical: 4
Number of units in operation: Manual: 0 Mechanical: 4
2. Bypass channel provided? ☐ Yes ☒ No
Bypass channel in use? ☐ Yes ☐ No ☒ N/A
3. Area adequately ventilated? ☒ Yes ☐ No
4. Alarm system for equipment failure or overloads? ☐ Yes ☒ No ☐ N/A
If present, is the alarm system operational? ☐ Yes ☐ No ☒ N/A
5. Proper flow-distribution between units? ☐ Yes ☐ No ☒ N/A
6. How often are units checked and cleaned? *The self-cleaning rotary units are checked daily*
7. Cycle of operation: *Continuous*
8. Volume of screenings removed: *Approximately 2 to 4 trailers daily*
9. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: These units are located inside the processing plant (Offal Room) and precede the Influent Pump Station. An auger conveys screenings to waiting trailers; materials are hauled to a rendering facility.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Sewage Pumping

1. Name of station: Process Wastewater Influent Pump Station – Wet Well Nos. 1 and 2
2. Location (if not at STP): N/A
3. Following equipment operable:

a. All pumps?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
b. Ventilation?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
c. Control system?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
d. Sump pump?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
e. Seal water system?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
4. Reliability considerations:

a. Class	N/A Industrial Wastewater Pump Station		
b. Alarm system operable?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
c. Alarm conditions monitored:			
1. high water level:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
2. high liquid level in dry well:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
3. main electric power:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
4. auxiliary electric power:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
5. failure of pump motors to start:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
6. test function:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
7. other:			
d. Backup for alarm system operational?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
e. Alarm signal reported to (identify):	<u>local audio and visual, lab building</u>		
f. Continuous operability provisions:			
1. Generator hook up?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<u>standby generator</u>
2. Two sources of electricity?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
3. Portable pump?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
4. 1 day storage?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
5. other:			
5. Does station have bypass?

	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
a. Evidence of bypass use?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
b. Can bypass be disinfected?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*	<input checked="" type="checkbox"/> N/A
c. Can bypass be measured?	<input type="checkbox"/> Yes	<input type="checkbox"/> No*	<input checked="" type="checkbox"/> N/A
6. How often is station checked? every 2 hours
7. General condition:

<input checked="" type="checkbox"/> Good	<input type="checkbox"/> Fair	<input type="checkbox"/> Poor
--	-------------------------------	-------------------------------

Comments: The station receives screened process wastewater and storm water runoff (Offal loading area) and pumps to the pretreatment facilities. The station is subdivided – Wet Well #1 and Wet Well #2. Wet Well #1 is an open tank equipped with 2 pumps, two mechanical mixers, and an overflow portal to Wet Well #2. Wet Well #2 is a covered tank also equipped with 2 pumps. All four centrifugal pumps and alarm systems are activated by sonic level detectors. Pumps #1 and #2 pump from Wet Well #1 and pumps #3 and #4 pump from Wet Well #2.

After screening, all wastewater flow enters Wet Well #1. From there it is pumped to the pre-DAF Acidulation Tank. Overflows from Wet Well #1 go to Wet Well #2. Excessive flows to Wet Well #1 may be diverted to the DAF FEB to achieve equalized flow through the DAF unit. The contents of the DAF FEB gravity flow back to Wet Well #1. DAF effluent flows by gravity to Anoxic Reactor #1 (7-Day FEB).

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Flow Equalization

"DAF FEB"

1. Type of unit: ☐ In-line ☒ Side-line ☐ Spill Pond
Number of cells: 1
Number of cells in operation: 1
2. What unit process does it precede? Wet Well #1
3. Is volume adequate? ☒ Yes ☐ No
4. Type of mixing: ☐ None ☒ Diffused air ☐ Fixed Mechanical
☐ Floating mechanical
5. Condition of mixing equipment: ☒ Good ☐ Average ☐ Poor
6. How drawn off?
 - a. Pumped from: **Gravity flow from the bottom** ☐ Surface ☐ Sub-surface ☐ Adjustable ☒ N/A
 - b. Weir: ☐ Surface ☐ Sub-surface ☒ N/A
7. What is the condition of the containment structure? ☒ Good ☐ Fair ☐ Poor
8. Are the facilities to flush solids and grease from basin walls adequate? ☒ Yes ☐ No ☐ N/A
9. Are there facilities for withdrawing floating material and foam? ☐ Yes ☒ No
10. How are solids removed? ☒ Drain down ☐ Drag line
☐ Other:
Is it adequate? ☒ Yes ☐ No
11. Is the emergency overflow in good condition? ☐ Yes ☐ No ☒ N/A
12. Are the depth gauges in good condition? ☐ Yes ☐ No ☒ N/A
13. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: Wastewater flows by gravity, from the bottom, back to Wet Well #1.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Floatation Thickening

(Dissolved Air Floatation – DAF)

1. Number of units: 1
Number of units in operation: 1
2. Floatation-aid system provided? ☒ Yes ☐ No
Type of aid/dosage: Cationic (7 ppm) and anionic polymers (4ppm)
3. Sludge pumping: ☐ Manual ☒ Automatic
4. Skimmer blade removal system operating properly? ☒ Yes ☐ No
5. Sludge collection system operating properly? ☒ Yes ☐ No
6. Effluent baffle system working properly? ☒ Yes ☐ No
7. Is the unit used to thicken sludges other than WAS? ☒ Yes ☐ No
If not specify other sludge(s): unit used to remove grease and floatables prior to biological stabilization and sedimentation
8. Signs of overloading? ☐ Yes ☒ No
9. Process control testing:
 - a. Feed solids testing: ☐ Yes ☒ No _____%
 - b. Thickened sludge solids testing: ☐ Yes ☒ No _____%
 - c. Underflow testing: ☐ Yes ☒ No _____
 - d. pH: ☒ Yes ☐ No continuous online
10. Percent capture of solids: not measured
11. General condition: ☐ Good ☒ Fair ☐ Poor

Comments: Wastewater is pumped from Wet Well #1 to the acidulation tank where sulfuric acid is added to bring the pH to between 4.7 and 5.2 S.U. The acidulated wastewater enters flocculation tubes where cationic and anionic polymers are injected. The flocculated wastewater then enters the Dissolved Air Floatation (DAF) unit. Sulfuric acid is stored in a secondary contained tank which is outside and adjacent to the DAF building. Polymers are stored in the DAF building. Heavy particles settle down and are collected in the sludge cone and the floating floc is skimmed off of the top. Captured solids are transported to a rendering facility.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Sewage Pumping

1. Name of station: Domestic Wastewater (Wet Well No. 3) Pump Station
2. Location (if not at STP): N/A
3. Following equipment operable:

a. All pumps?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
b. Ventilation?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
c. Control system?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
d. Sump pump?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
e. Seal water system?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
4. Reliability considerations:

a. Class	<input checked="" type="checkbox"/> I	<input type="checkbox"/> II	<input type="checkbox"/> III
b. Alarm system operable?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
c. Alarm conditions monitored:			
1. high water level:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
2. high liquid level in dry well:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
3. main electric power:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
4. auxiliary electric power:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
5. failure of pump motors to start:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
6. test function:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
7. other:	<u>N/A</u>		
d. Backup for alarm system operational?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
e. Alarm signal reported to (identify):	<u>Lab building</u>		
f. Continuous operability provisions:			
1. Generator hook up?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<u>standby generator</u>
2. Two sources of electricity?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
3. Portable pump?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
4. 1 day storage?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
5. other:			
5. Does station have bypass? ☐ Yes ☒ No

a. Evidence of bypass use?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
b. Can bypass be disinfected?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
c. Can bypass be measured?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
6. How often is station checked? Every 2 hours
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: This station receives domestic wastewater from the plant and surface runoff from the chicken off-loading area. Raw sewage pump #5 and #6 pump wastewater from Wet Well #3 to the 7-Day FEB.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Anoxic Reactor #1 (7-Day FEB)

1. Type of unit: ☒ In-line ☐ Side-line ☐ Spill Pond
Number of cells: 1
Number of cells in operation: 1
2. What unit process does it precede? **CMAS (complete mix activated sludge unit)**
3. Is volume adequate? ☒ Yes ☐ No
4. Type of mixing: ☐ None ☒ Diffused air ☐ Fixed Mechanical
☐ Floating mechanical
5. Condition of mixing equipment: ☐ Good ☒ Average ☐ Poor
6. How drawn off?
 - a. Pumped from: ☐ Surface ☒ Sub-surface ☐ Adjustable ☐ N/A
 - b. Weir: ☐ Surface ☐ Sub-surface ☒ N/A
7. What is the condition of the containment structure? ☒ Good ☐ Fair ☐ Poor
8. Are the facilities to flush solids and grease from basin walls adequate? ☒ Yes ☐ No ☐ N/A
9. Are there facilities for withdrawing floating material and foam? ☐ Yes ☒ No
10. How are solids removed? ☒ Drain down ☐ Drag line
☐ Other:
Is it adequate? ☒ Yes ☐ No
11. Is the emergency overflow in good condition? ☐ Yes ☐ No ☒ N/A
12. Are the depth gauges in good condition? ☒ Yes ☐ No ☐ N/A
13. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: The 7-Day FEB was retrofitted into an anoxic reactor as part of the upgrade to the four stage Bardenpho biological nutrient removal (BNR) process. Mixing in the reactor is provided by 10, 7.5 HP floating mixers. For aeration, subsurface diffuser laterals are located on the bottom of the basin. It was noted that these diffusers are only turned on for one hour each night to exercise the blower and prevent the diffusers from filling up with water. The processing plant generally operates only 5 days per week, so the level in the basin increases during the week, and is drawn down on the weekend. In turn, the waste load at the WWTP is a little lighter on Monday after the weekend, and is heavier by the end of the week. Some accumulation of solids beneath the water surface along the perimeter of the basin was visible. Mr. French noted that solids slowly accumulate where the influence of the mixtures does not reach; solids that accumulate are periodically removed by a contractor. A magnetic flow meter measures flow from the reactor basin. A high liquid-level condition will alarm in the lab building. The 7-Day FEB receives flow from the DAF, Return Activated Sludge (RAS) from the clarifier, nitrate recycle from the Complete Mix Activated Sludge (CMAS) unit, domestic wastewater from the plant, and backwash water from the sand filters.

At the time of the inspection, the 7-Day FEB was receiving RAS at a rate of 1200 gallons per minute. The nitrate recycle from the CMAS back to the 7-Day FEB was 2500 gallons per minute.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Activated Sludge Aeration (Aerobic Reactor #2)

1. Number of units: 1 Complete Mix Activated Sludge Unit (CMAS)
 Number of units in operation: 1
2. Mode of operation: BNR
3. Proper flow distribution between units? ☐ Yes ☐ No ☒ N/A
4. Foam control operational? ☐ Yes ☐ No ☒ N/A
5. Scum control operational? ☐ Yes ☐ No ☒ N/A
6. Evidence of the following problems:
 - a. Dead spots? ☐ Yes ☒ No
 - b. Excessive foam? ☐ Yes ☒ No
 - c. Poor aeration? ☐ Yes ☒ No
 - d. Excessive aeration? ☐ Yes ☒ No
 - e. Excessive scum? ☐ Yes ☒ No
 - f. Aeration equipment malfunction? ☐ Yes ☒ No
 - g. Other:
7. Mixed liquor characteristics (as available) ***As described on the bench sheet for August 29, 2013 at 1200***

pH: <u>6.89 SU</u>	MLSS: <u>5620 mg/L</u>
DO: <u>2.41 mg/L</u>	SDI: <u>not obtained</u>
SVI: <u>not obtained</u>	Color: <u>Medium Brown</u>
Odor: <u>earthy</u>	Settleability: <u>not obtained</u>
	Other:
8. Return/waste sludge:
 - a. return rate: 1200 gpm to Anoxic Reactor #1 (7-Day FEB)
 - b. waste rate: Varies depending on operational status of belt press
 - c. frequency of wasting: Varies depending on operational status of belt press

☐ Time Clock ☒ Manual ☐ Continuous
9. Aeration system control: ☐ Other
10. Effluent control devices working properly (***oxidation ditches***)? ☐ Yes ☐ No ☒ N/A
11. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: Diffused air is provided by three dedicated blowers; 2 of the 3 blowers were operating at the time of the inspection. Temperature, dissolved oxygen, and pH are continuously monitored in situ. The aeration cycle is manually controlled as needed in order to maintain the target operating range for D.O. between 2 and 3 mg/L.

MgOH is added prior to CMAS for alkalinity and pH control. The CMAS is also equipped with two recirculation pumps to aid mixing. The CMAS is equipped with an overflow riser to the 7-Day FEB. RAS from the clarifier returns to the 7-Day FEB.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Anoxic Reactor #3 and Aerobic Reactor #4

1. Number of units: 1 tank divided by a partition that contains both reactors
Number of units in operation: 2
2. Mode of operation: BNR
3. Proper flow distribution between units? ☒ Yes ☐ No ☐ N/A
4. Foam control operational? ☐ Yes ☐ No ☒ N/A
5. Scum control operational? ☐ Yes ☐ No ☒ N/A
6. Evidence of the following problems:
- a. Dead spots? ☐ Yes ☒ No
 - b. Excessive foam? ☐ Yes ☒ No
 - c. Poor aeration? ☐ Yes ☒ No
 - d. Excessive aeration? ☐ Yes ☒ No
 - e. Excessive scum? ☐ Yes ☒ No
 - f. Aeration equipment malfunction? ☐ Yes ☒ No
 - g. Other:
7. Mixed liquor characteristics (as available) *As viewed during the inspection on the Allen Bradley control system for Reactor #4*
- | | | | |
|-------|---------------------|----------------|--|
| pH: | <u>not obtained</u> | MLSS: | <u>not obtained</u> |
| DO: | <u>5.42 mg/L</u> | SDI: | <u>not obtained</u> |
| SVI: | <u>not obtained</u> | Color: | <u>Medium Brown</u> |
| Odor: | <u>earthy</u> | Settleability: | <u>not obtained</u> |
| | | Other: | <u>Temperature = 27.4 Celsius; Nitrate = 13.7 mg/L</u> |
8. Return/waste sludge:
- a. return rate: Not applicable
 - b. waste rate: Not applicable
 - c. frequency of wasting: Not applicable
☐ Time Clock ☐ Manual ☐ Continuous
9. Aeration system control: ☒ Other PLC
10. Effluent control devices working properly (*oxidation ditches*)? ☐ Yes ☐ No ☒ N/A
11. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: Effluent from Reactor #2 flows to Reactor #3 where final nitrate removal occurs by biological denitrification. Mixing in this reactor is provided by 2, 10 HP floating surface mixers. After Reactor #3, wastewater flows over the baffle wall and into Aerobic Reactor #4, which serves as a polishing reactor for final removal of soluble CBOD and ammonia nitrogen. Diffused air is supplied to Reactor #4 via 2, 50 HP blowers. From Reactor #4, wastewater gravity flows to the secondary clarifier. Aluminum sulfate is continuously added as a coagulant (to aid phosphorus removal) to Reactor #4 at a rate of 1700 mL/min. At the time of the inspection, an aboveground line was feeding aluminum sulfate to Reactor #4 since the subsurface line was reportedly damaged.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Sedimentation

☐ Primary ☒ Secondary ☐ Tertiary

1. Number of units: 1
In operation: 1
2. Proper flow-distribution between units? ☐ Yes ☐ No ☒ N/A
3. Signs of short-circuiting and/or overloads? ☐ Yes ☒ No
4. Effluent weirs level? ☒ Yes ☐ No ☐ N/A
Clean? ☐ Yes ☒ No
5. Scum collection system working properly? ☐ Yes ☒ No ☐ N/A
6. Sludge-collection system working properly? ☒ Yes ☐ No ☐ N/A
7. Influent, effluent baffle systems working properly? ☒ Yes ☐ No ☐ N/A
8. Chemical addition? ☐ Yes ☒ No
Chemicals:
9. Effluent characteristics: clear with a trace of solids
10. General condition: ☐ Good ☐ Fair ☒ Poor See comments below

Comments: The entire surface of the clarifier contained a layer of floating solids. Some trace amounts of suspended solids appeared to be in the effluent from the clarifier. At the time of the inspection, the skimming mechanism for the clarifier was not operating. Reportedly, the skimmer arm got caught on one of the scum troughs at the end of July, 2013 and damaged the system. The initial attempt to repair the system failed due to improper parts. It was reported that the skimming system should be repaired the week following this inspection. In a follow-up conversation with Mr. French on 10/2/2013, it was noted that the clarifier has not yet been repaired, but they anticipate the repairs occurring in the next week. Mr. French confirmed that they are not experiencing any issues with final effluent from the treatment process as a result of the problem with the clarifier. From the clarifier, flow is gravity fed to the tertiary sand filters which is likely preventing solids from entering effluent from the treatment plant.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Sludge Pumping

(RAS and WAS)

1. Number of Pumps: 2
Number of pumps in operation: 1
2. Type of sludge pumped: ☐ Primary ☐ Secondary ☒ Return Activated
☐ Combination ☒ Other: WAS
3. Type of pump: ☐ Plunger ☐ Diaphragm ☐ Screwlift
☒ Centrifugal ☐ Progressing cavity ☐ Other:
4. Mode of operation: ☒ Manual ☐ Automatic ☐ Other:
5. Sludge volume pumped: *RAS continuously @ ~ 1200 gallons per minute*
Not wasting to the belt press at the time of inspection due to mechanical problems with the belt press
6. Alarm system for equipment failures or overloads operational? ☐ Yes ☐ No ☒ N/A
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: None

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Filtration (Tertiary)

- | | | | |
|--|---|---|---|
| 1. Type of filters: | <input checked="" type="checkbox"/> Gravity | <input type="checkbox"/> Pressure | <input type="checkbox"/> Intermittent |
| 2. Number of units: | <u>5</u> | | |
| Number in operation: | <u>5</u> | | |
| 3. Operation of system: | <input checked="" type="checkbox"/> Automatic | <input type="checkbox"/> Semi-automatic | |
| | <input type="checkbox"/> Manual | <input type="checkbox"/> Other (specify): | |
| 4. Proper flow-distribution between units? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 5. Evidence of following problems: | | | |
| a. Uneven flow distribution? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |
| b. Filter clogging (ponding)? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |
| c. Nozzles clogging? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| d. Icing? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| e. Filter flies? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |
| f. Vegetation on filter? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |
| 6. Filter aid system provided? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | |
| Properly operating? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| Chemical used: | <u>None</u> | | |
| 7. Automatic valves properly operating? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 8. Valves sequencing correctly? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 9. Backwash system operating properly? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 10. Filter building adequately ventilated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 11. Effluent characteristics: | <u>Clear</u> | | |
| 12. General condition: | <input checked="" type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |

Comments: Continuous backwash filters replaced the previous filters since the last inspection. Filter backwash gravity feeds to the 7-Day FEB.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Ultraviolet (UV) Disinfection

- | | |
|--|---|
| 1. Number of UV lamps/assemblies: | 2 Banks in series, each with 40 lamps |
| Number in operation: | 1 (second bank is backup) |
| 2. Type of UV system and design dosage: | Trojan UV 3000 PTP, 14.0 mw/cm ² |
| 3. Proper flow distribution between units? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| 4. Method of UV intensity monitoring? | continuous |
| 5. Adequate ventilation of ballast control boxes? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| 6. Indication of on/off status of all lamps provided? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 7. Lamps assemblies easily removed for maintenance? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 8. Records of lamp operating hours & replacement dates provided: | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 9. Routine cleaning system provided? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Operated properly? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Frequency of routine cleaning: | Lamps are cleaned every couple of months |
| 10. Lamp energy control system operating properly? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 11. Date of last system overhaul: | not determined |
| a. UV unit completely drained | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| b. all surfaces cleaned | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| c. UV transmissibility checked | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| d. output of selected lamps checked | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| e. output of tested lamps | |
| f. total operating hours, oldest lamp/assembly | |
| g. number of spare lamps and ballasts available: | not determined |
| 12. UV protective eyeglasses provided: | |
| 13. General condition: | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor |

Comments: Bulbs are replaced in the system after 12,000 hours of use. From here, flow goes to the old chlorine contact tank before the final effluent is discharged.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Post Aeration

1. Number of units: 1
Number of units in operation: 1
2. Proper flow distribution between units? ☐ Yes ☐ No ☒ N/A
3. Evidence of following problems:
- a. Dead spots? ☐ Yes ☒ No
- b. Excessive foam? ☐ Yes ☒ No
- c. Poor aeration? ☐ Yes ☒ No
- d. Mechanical equipment failure? ☐ Yes ☒ No ☐ N/A
4. How is the aerator controlled? ☐ Time clock ☒ Manual ☐ Continuous
☐ Other _____ ☐ N/A
5. What is the current operating schedule? continuous
6. Step weirs level? ☐ Yes ☐ No* ☒ N/A
7. Effluent D.O. level: 9.63 mg/L at 0640 (as reported by the facility)
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: A blower provides diffused aeration in the old chlorine contact channel.

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Flow Measurement

☐ Influent ☐ Intermediate ☒ Effluent

1. Type measuring device: 90° v-notch weir and an ultra-sonic sensor (TIR equip.)
2. Present reading: 438 gallons per minute at 1222 on 8/30/2013
3. Bypass channel? ☐ Yes ☒ No
Metered? ☐ Yes ☐ No ☒ N/A
4. Return flows discharged upstream from meter? ☐ Yes ☒ No
If Yes, identify:
5. Device operating properly? ☒ Yes ☐ No
6. Date of last calibration: 8/14/2013
7. Evidence of following problems:
 - a. Obstructions? ☐ Yes ☒ No
 - b. Grease? ☐ Yes ☒ No
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

Wastewater Facility Inspection Report

Permit # VA0004031

UNIT PROCESS: Pressure Filtration (Sludge)

(Belt Press)

1. Number of units: 1
- Number In operation: 0
2. Percent solids in influent sludge: Not obtained
3. Percent solids in discharge cake: Not obtained
4. Filter run time: Not obtained
5. Amount cake produced: Not obtained
6. Conditioning chemicals used: ☒ Yes ☐ No
- Type and Dose: Cationic Emulsion; dose not obtained
7. Sludge pumping: ☒ Manual ☐ Automatic
8. Recirculating system included on acid wash: ☐ Yes ☐ No ☒ N/A
9. Signs of overloads? ☐ Yes ☒ No
10. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: The belt press is located in the DAF building and it is used when it is operational. The belt press was not operating at the time of the inspection due to mechanical problems.

Wastewater Facility Inspection Report

Permit # VA0004031

EFFLUENT FIELD DATA: For 8/30/2013

Flow	<input type="text"/> MGD	Dissolved Oxygen	<input type="text" value="9.36"/> mg/l	TRC (Contact Tank)	<input type="text"/> mg/l
pH	<input type="text" value="6.71"/> S.U.	Temperature	<input type="text"/> °C	TRC (Final Effluent)	<input type="text"/> mg/l
Was a Sampling Inspection conducted? <input type="checkbox"/> Yes (see Sampling Inspection Report) <input checked="" type="checkbox"/> No					

CONDITION OF OUTFALL AND EFFLUENT CHARACTERISTICS:

<p>1. Type of outfall: <input checked="" type="checkbox"/> Shore based <input type="checkbox"/> Submerged Diffuser? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>2. Are the outfall and supporting structures in good condition? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>3. Final Effluent (evidence of following problems): None <input type="checkbox"/> Sludge bar <input type="checkbox"/> Grease <input type="checkbox"/> Turbid effluent <input type="checkbox"/> Visible foam <input type="checkbox"/> Unusual color <input type="checkbox"/> Oil sheen</p> <p>4. Is there a visible effluent plume in the receiving stream? The receiving stream was not observed <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>5. Receiving stream: The receiving stream was not observed <input type="checkbox"/> No observed problems <input type="checkbox"/> Indication of problems (explain below)</p> <p>Comments: The receiving stream was not observed. Effluent from the treatment and effluent in the discharge channel that runs across the property was clear. Fish were observed in the discharge channel.</p>

Wastewater Facility Inspection Report

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REQUEST for ACTION:

1. None

NOTES and COMMENTS:

1. The clarifier is in need of repairs. During the inspection, the surface of the clarifier was covered in floating solids. During a follow-up conversation with Mr. French on October, 2, 2013, this inspector inquired as to whether the clarifier had been repaired since the inspection. During that discussion, it was reported that the repairs should be completed sometime the following week. The presence of significant solids on the surface increases the potential for solids to enter the effluent leaving the clarifier. Increased solids flowing to the sand filters may decrease filtering capability. The clarifier does not appear to be operating in accordance with the operations and maintenance manual and should be repaired as soon as possible.
2. The sludge filter belt press was not operating at the time of the inspection due to mechanical problems. It was reported that wasting to the press occurs when the press is operational, but that the press is not consistently operational. During a follow-up conversation with Mr. French on October 2, 2013, the press had been operating successfully for the previous two weeks. It appears that the press could benefit from additional routine maintenance being performed to ensure that the press is available when needed.
3. A review of the VAN040089 – General Permit for Total Nitrogen and Total Phosphorus Discharges - discharge monitoring report for the July, 2013 monitoring period was performed as part of this inspection. Copies of the certificates of analysis from “Air Water and Soil Laboratories, Inc.” for the July, 2013 monitoring period were reviewed and the nutrient loading calculations for July, 2013 were duplicated by this inspector. The nutrient discharge monitoring report for July, 2013 appears to be complete and accurate.
4. The waste sludge pond is no longer in service, so the facility depends on the belt press to be operating properly in order to waste sludge.

Wastewater Facility Inspection Report

Permit # VA0004031

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

1. Has a SWPPP been developed and implemented? [x] Yes [] No
2. Was the SWPPP, compliance inspection report, and other information available and is the SWPPP current? [x] Yes [] No
3. Contents must include:
- Pollution prevention team identification and responsibilities [x] Yes [] No
- Description of potential pollutant sources must include: [x] Yes [] No
- Detailed site drainage map
 - Inventory of exposed materials
 - Updated list of spills and leaks of toxic or hazardous pollutants
 - Sampling data N/A
 - Risk identification and summary of potential pollutant sources
- Measures and controls must include: [x] Yes [] No
- Good housekeeping
 - Preventive maintenance
 - Spill prevention and response procedures
 - Routine inspections and visual exam of storm water samples plus documentation and follow up tracking and procedures
 - Employee training
 - Record keeping and internal reporting procedures
 - Sediment and erosion control
 - Management of run-off
- Annual Comprehensive site compliance evaluation? [x] Yes [] No
- Visual inspection of all areas contributing to a storm water discharge with industrial activity; evaluation of measures to reduce pollutant loadings; observing structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures; visual inspection of equipment needed to implement the plan
 - Based on results of evaluation, revise SWPPP
 - Compliance inspection report summarizing the scope of the evaluation, personnel making evaluation, dates of evaluation, major observations, actions taken, certification of compliance and signatory requirements met
- Requirements for facilities subject to Emergency Planning and Community Right to Know Act (EPCRA) Section 313 [x] Yes [] No

Comments: The SWPPP was last updated on 1/7/2013 upon completion of the comprehensive site compliance evaluation that was completed on the same day. Quarterly visual monitoring for the first and second quarters of 2013 was reviewed during this inspection.

Wastewater Facility Inspection Report

Permit # VA0004031

LABORATORY INSPECTION

PRESENT DURING INSPECTION: Austin French	
1. Do lab records include sampling date/time, analysis date/time, sample location, test method, test results, analyst's initials, instrument calibration and maintenance, and Certificate of Analysis? <input checked="" type="checkbox"/> Sampling Date/Time <input checked="" type="checkbox"/> Analysis Date/Time <input checked="" type="checkbox"/> Sample Location <input checked="" type="checkbox"/> Test Method <input checked="" type="checkbox"/> Test Results <input checked="" type="checkbox"/> Analyst's Initials <input checked="" type="checkbox"/> Instrument Calibration & Maintenance <input checked="" type="checkbox"/> Chain of Custody <input checked="" type="checkbox"/> Certificate of Analysis	
2. Are Discharge Monitoring Reports complete and correct? Month(s) reviewed: <div style="border: 1px solid black; padding: 2px; display: inline-block;">July, 2013</div>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Are sample location(s) according to permit requirements (after all treatment unless otherwise specified)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. Are sample collection, preservation, and holding times appropriate; and is sampling equipment adequate?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Are grab and composite samples representative of the flow and the nature of the monitored activity?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. If analysis is performed at another location, are shipping procedures adequate? List parameters and name & address of contract lab(s): <div style="padding-left: 40px;"> BOD, TSS, Fecal Coliform, Total Phosphorus, Total Nitrogen, Ammonia, TKN, Settleable Solids, E. Coli, Total Recoverable Zinc, and Total Nitrite and Nitrate is performed by Air Water and Soil Laboratories, Inc. in Richmond, VA. </div>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7. Is Laboratory equipment in proper operating range? Auto sampler: temperature not observed during this inspection.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8. Are annual thermometer calibration(s) adequate? Not determined	<input type="checkbox"/> Yes <input type="checkbox"/> No
9. Is the laboratory grade water supply adequate? Not Applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No
10. Are analytical balance(s) adequate? Not Applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No

Wastewater Facility Inspection Report

11. Parameters evaluated during this inspection (attach checklists):

☒ pH

☐ Temperature

☒ Total Residual Chlorine

☒ Dissolved Oxygen

☐ Biochemical Oxygen Demand

☐ Total Suspended Solids

☐ Other (specify)

☐ Other (specify)

☐ Other (specify)

Comments:

Wastewater Facility Inspection Report

Permit # VA0004031

LABORATORY INSPECTION

REQUEST for ACTION:

1. In May 2012, EPA issued a final rule to approve several new or revised analytical methods for measuring regulated pollutants in wastewater. This rule is also called the Methods Update Rule (MUR). One of the changes in this MUR is the naming convention used for citing Standard Methods. Citing the edition of Standard Methods is no longer applicable; now the citation must include the "date tag" in which the method was approved. Also note that for pH, D.O. and TRC, the 18th and 19th Editions of Standard Methods are no longer approved. Only the 20th, 21st and online Editions are approved. The current method citations are: D.O.: SM4500-O G -2001; pH: SM4500-H⁺ B -2000; TRC: SM4500-Cl G -2000 [**This item is new guidance and does not require a response**]
2. During the inspection, it was not determined if the thermistor present in the pH and D.O. meter is verified annually. The thermistor in the pH and D.O. meter should be verified against a NIST certified thermometer annually. **No response to this item is required.**
3. Initial Demonstration of Capability (IDC) must be completed by each operator who analyzes samples for pH, TRC, and D.O. **This item is new guidance and was discussed during the inspection, so no response is necessary. Please see the enclosed forms for instructions. Please note that there are no specific credentials required for the witness involved with the IDC.**
4. Three buffers should be used to perform the daily calibration of the pH meter. **This item was discussed during the inspection so no response to this item is required.**

NOTES and COMMENTS:

None

Wastewater Facility Inspection Report

ANALYST:	Discussed with Austin French	VPDES NO	VA0004031
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Meter: YSI 52

Parameter: Dissolved Oxygen
Method: Membrane Electrode
Facility Elevation: approximately 240'
1/08

METHOD OF ANALYSIS:

X	18 th Edition of Standard Methods – 4500-O G
	21 st or Online Editions of Standard Methods – 4500-O G (01)

DO is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]		Y	N
1)	Is a certificate of operator competence or initial demonstration of capability available for <u>each</u> analyst/operator performing this analysis? [SM 1020 B.1]		X
2)	If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation and is the sample bottle allowed to overflow several times its volume? [1.c]	X	
3)	Are meter and electrode operable and providing consistent readings? [3]	X	
4)	Is membrane in good condition without trapped air bubbles? [3.b]	X	
5)	Is correct filling solution used in electrode? [Mfr.]	X	
6)	Are water droplets shaken off the membrane prior to calibration? [Mfr.]	X	
7)	Is meter calibrated before use or at least daily? [Mfr. & Part 1020]	X	
8)	Is calibration procedure performed according to manufacturer's instructions? [Mfr.]	X	
9)	Is sample stirred during analysis? [Mfr.]	X	
10)	Is the sample analysis procedure performed according to manufacturer's instructions? [Mfr.]	X	
11)	Is meter stabilized before reading D.O.? [Mfr.]	X	
12)	Is electrode stored according to manufacturer's instructions? [Mfr.]	X	

PROBLEMS: An Initial Demonstration of Capability (IDC) needs to be completed. Mr. French believed that the meter was set to an elevation, but he was unable to confirm while onsite. The meter should be evaluated to confirm that it is set to the appropriate elevation for the facility. The approximate elevation for the facility as noted above is 240 feet. This elevation was noted on the inspection report for the inspection conducted on April 2, 2008.

Wastewater Facility Inspection Report

ANALYST:	Discussed with Austin French	VPDES NO	VA0004031
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Meter: **HQ 30d HACH Meter**

Parameter: Hydrogen Ion (pH)
1/08

Method: Electrometric

METHOD OF ANALYSIS:

X	18 th Edition of Standard Methods – 4500-H ⁺ B
	21 st or Online Editions of Standard Methods – 4500-H ⁺ B (00)

pH is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]		Y	N
1)	Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? NOTE: Analyze 4 samples of known pH. May use external source of buffer (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be +/- 0.1 SU of the known concentration of the sample. [SM 1020 B.1]		X
2)	Is the electrode in good condition (no chloride precipitate, scratches, deterioration, etc.)? [2.b/c and 5.b]	X	
3)	Is electrode storage solution in accordance with manufacturer's instructions? [Mfr.]	X	
4)	Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [4.a] NOTE: Follow manufacturer's instructions. Only two buffers		X
5)	After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Agreement should be within +/- 0.1 SU. [4.a]	X	
6)	Do the buffer solutions appear to be free of contamination or growths? [3.1]	X	
7)	Are buffer solutions within the listed shelf-life or have they been prepared within the last 4 weeks? [3.a]	X	
8)	Is the cap or sleeve covering the access hole on the reference electrode removed when measuring pH? [Mfr.]	X	
9)	For meters with ATC that also have temperature display, is the thermometer verified annually? [SM 2550 B.1]	Not determined	
10)	Is temperature of buffer solutions and samples recorded when determining pH? [4.a]	X	
11)	Is sample analyzed within 15 minutes of collections? [40 CFR Part 136]	X	
12)	Is the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinsing solution.)? [4.a]	X	
13)	Is the sample stirred gently at a constant speed during measurement? [4.b]	X	
14)	Does the meter hold a steady reading after reaching equilibrium? [4.b]	X	

PROBLEMS: An IDC needs to be completed and only two buffers are currently being used along with a post calibration check. It was not determined if the thermistor is verified annually with a NIST thermometer.

Wastewater Facility Inspection Report

ANALYST:	Discussed with Austin French	VPDES NO.	VA0004031
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Instrument: **DR 2800 HACH Meter**

Parameter: Total Residual Chlorine (TRC)
 Method: DPD Colorimetric (HACH Pocket Colorimeter)
 1/08

METHOD OF ANALYSIS:

X	HACH Manufacturer's Instructions (Method 8167) plus an edition of <i>Standard Methods</i>
X	18 th Edition of <i>Standard Methods</i> 4500-Cl G
	21 st Edition of <i>Standard Methods</i> 4500-Cl G (00)

	Y	N
1) Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? NOTE: Analyze 4 samples of known TRC. Must use a lot number or source that is different from that used to prepare calibration standards. May not use SpecV™. [SM 1020 B.1]		X
2) Are the DPD PermaChem™ Powder Pillows stored in a cool, dry place? [Mfr.]	X	
3) Are the pillows within the manufacturer's expiration date? [Mfr.] <i>pillows expire 11/2016</i>	X	
4) Has buffering capability of DPD pillows been checked annually? (Pillows should adjust sample pH to between 6 and 7) [Mfr.]	X	
5) When pH adjustment is required, is H ₂ SO ₄ or NaOH used? [Hach 11.3.1]	X	
6) Are cells clean and in good condition? [Mfr.]	X	
7) Is the low range (0.01 mg/L resolution) used for samples containing residuals from 0.2.00 mg/L? [Mfr.]	X	
8) Is calibration curve developed (may use manufacturer's calibration) with daily verification using a high and a low standard? NOTE: May use manufacturer's installed calibration and commercially available chlorine standards for daily calibration verifications. [18 th ed 1020 B.5; 21 st ed 4020 B.2.b]	X	
9) Is the 10-mL cell (2.5-cm diameter) used for samples from 0-2.00 mg/L? [Mfr.]	X	
10) Is meter zeroed correctly by using sample as blank for the cell used? [Mfr.]	X	
11) Is the instrument cap placed correctly on the meter body when the meter is zeroed and when the sample is analyzed? [Mfr.]	X	
12) Is the DPD Total Chlorine PermaChem™ Powder Pillow mixed into the sample? [Hach 11.1]	X	
13) Is the analysis made at least three minutes but not more than six minutes after PermaChem™ Powder Pillow addition? [Hach 11.2]	X	
14) If read-out is flashing [2.20], is sample diluted correctly, and then reanalyzed? [Hach 1.2 & 2.0]	X	
15) Are samples analyzed within 15 minutes of collection? [40 CFR Part 136]	X	

PROBLEMS: **An IDC needs to be completed.**

Wastewater Facility Inspection Report

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION

SAMPLE ANALYSIS HOLDING TIME/CONTAINER/PRESERVATION CHECK SHEET

Revised 04/13 [40 CFR, Part 136.3, Table II]

FACILITY NAME:		Tyson Foods, Inc.		VPDES NO	VA0004031	DATE:	August 30, 2013				
HOLDING TIMES [Note: Collection period (for composites) and Sample Collection time (end of collection period) must be recorded on the COC.]											
PARAMETER	APPROVED	MET?		LOGGED?		SAMPLE CONTAINER			APPROVED	PRESERVATION [Note: Preservation is to occur within 15 minutes of the end of the collection period.]	
		Y	N	Y	N	ADEQ. VOLUME	APPROP. TYPE	Y		N	Y
pH	15 MIN.	X		X		X	X		N/A		
CHLORINE	15 MIN.	X		X		X	X		N/A		
DISSOLVED O ₂	15 MIN./IN SITU	X		X		X	X		N/A		
TEMPERATURE	IMMERSION STAB.								N/A		
BOD5 & CBOD5	48 HOURS	X		X		X	X		ANALYZE 2 HRS or ≤6° C	X	X
TSS	7 DAYS	X		X		X	X		≤6° C	X	X
FECAL COLIFORM / E. coli / Enterococci	6 HRS & 2 HRS TO PROCESS	X		X		X	X		<10° C (1 HOUR)+0.008% Na ₂ S ₂ O ₃	X	X
OIL & GREASE	28 DAYS	X		X		X	X		≤6° C+H ₂ SO ₄ /HCL pH<2	X	X
AMMONIA	28 DAYS	X		X		X	X		≤6° C+H ₂ SO ₄ pH<2 DECHLOR	X	X
TKN	28 DAYS	X		X		X	X		≤6° C+H ₂ SO ₄ pH<2 DECHLOR	X	X
NITRATE	48 HOURS								≤6° C		
NITRATE+NITRITE	28 DAYS	X		X		X	X		≤6° C+H ₂ SO ₄ pH<2	X	X
NITRITE	48 HOURS								≤6° C		
PHOSPHATE, ORTHO	48 HOURS								FILTER, ≤6° C		
TOTAL PHOS.	28 DAYS	X		X		X	X		≤6° C+H ₂ SO ₄ pH<2	X	X
METALS (except Hg)	6 MONTHS	X		X		X	X		HNO ₃ pH<2	X	X
MERCURY	28 DAYS										
PROBLEMS: None											

Wastewater Facility Inspection Report

Permit # VA0004031

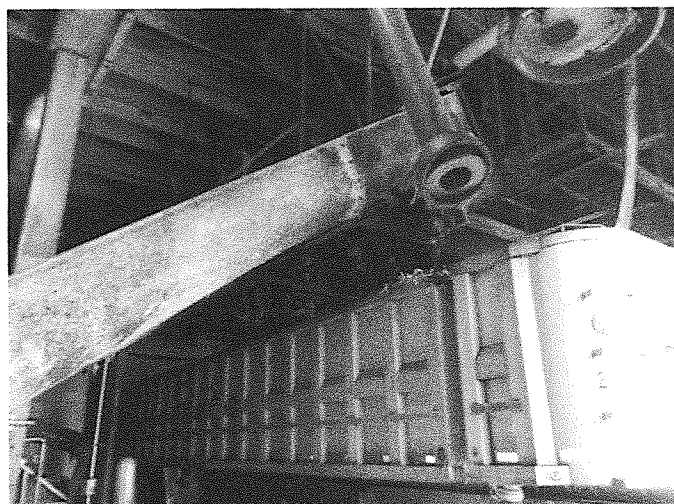
Digital Photographs Taken: 8/30/2013



Photograph 1: Sulfuric acid tanks with secondary containment



Photograph 2: Dissolved Air Floatation (DAF) unit



Photograph 3: Trailer receiving screenings



Photograph 4: Trees that were reportedly planted to block the view of the treatment plant from state route 33



Photograph 5: Anoxic Reactor #1 (7-Day FEB)

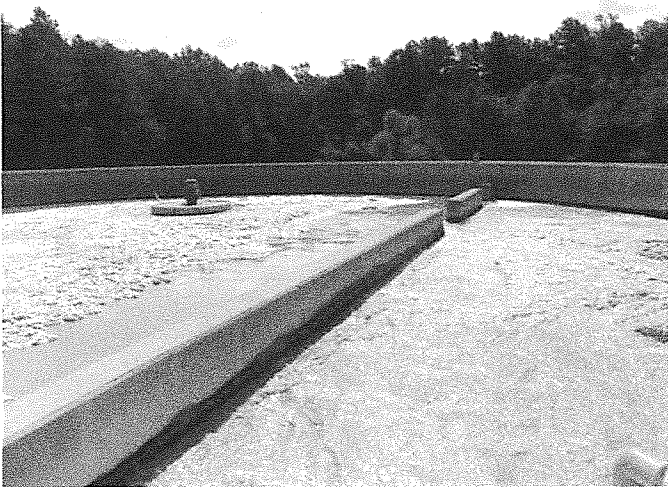


Photograph 6: Aerobic Reactor #2 (CMAS)

Wastewater Facility Inspection Report

Permit # VA0004031

Digital Photographs Taken: 8/9/2013



Photograph 7: Anoxic Reactor #3 (left) and Aerobic Reactor #4 (right)



Photograph 8: Floating solids covering the entire surface of the clarifier



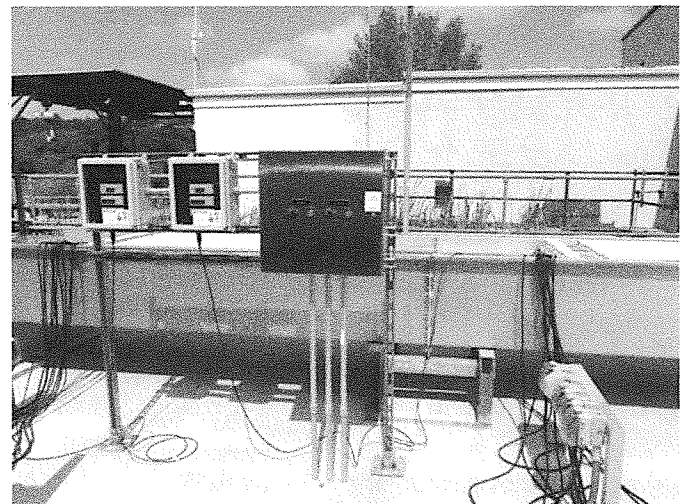
Photograph 9: Mostly clear effluent from the clarifier; a trace of solids was noted in the effluent channel



Photograph 10: Photo depicts solids between scum baffle and weir with an algal mat in the effluent channel



Photograph 11: Clear effluent flow from the sand filters



Photograph 12: UV disinfection system

Wastewater Facility Inspection Report

Permit # VA0004031

Digital Photographs Taken: 8/30/2013



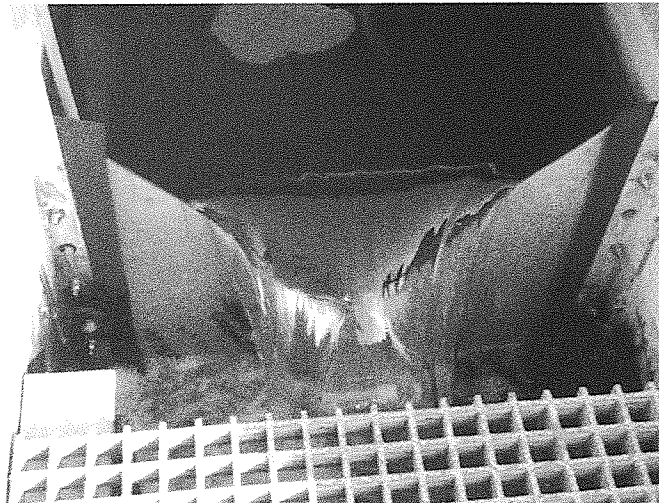
Photograph 13: Materials storage under cover and fenced in



Photograph 14: Truck fueling area



Photograph 15: Spill kit in the truck fueling area



Photograph 16: Final clear effluent from the treatment plant



Photograph 17: Clear effluent in the discharge channel for the treatment plant; fish were observed in this channel



Photograph 18: Location where the stormwater outfall 002 combines with flow from outfall 001

Attachment D: Applicable Federal Effluent Limitation Guidelines

Subpart K—Poultry First Processing

§432.110 Applicability.

This part applies to discharges of process wastewater resulting from the slaughtering of poultry, further processing of poultry and rendering of material derived from slaughtered poultry. Process wastewater includes water from animal holding areas at these facilities.

§432.111 Special definitions.

For the purpose of this subpart: *Poultry first processing* means slaughtering of poultry and producing whole, halved, quarter or smaller meat cuts.

§432.112 Effluent limitations attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in [40 CFR 125.30](#) through 125.32, any existing point source subject to this subpart that slaughters more than 100 million pounds per year (in units of LWK) must achieve the following effluent limitations representing the application of BPT:

Effluent Limitations

[BPT]

Regulated parameter	Maximum daily¹	Maximum monthly avg.¹
Ammonia (as N)	8.0	4.0
BOD ₅	26	16
Fecal Coliform	(²)	(³)
O&G (as HEM)	14	8.0
TSS	30	20

¹mg/L (ppm).

²Maximum of 400 MPN or CFU per 100 mL at any time.

³No maximum monthly average limitation.

§432.113 Effluent limitations attainable by the application of the best available technology economically achievable (BAT).

Except as provided in [40 CFR 125.30](#) through 125.32, any existing point source subject to this subpart that slaughters more than 100 million pounds per year (in units of LWK) must achieve the following effluent limitations representing the application of BAT:

Effluent Limitations

[BAT]

Regulated parameter	Maximum daily¹	Maximum monthly avg.¹
Ammonia (as N)	8.0	4.0
Total Nitrogen	147	103
¹ mg/L (ppm).		

§432.114 Pretreatment standards for existing sources (PSES). [Reserved]

§432.115 New source performance standards (NSPS).

Any source that is a new source subject to this subpart must achieve the following performance standards:

(a) Facilities that slaughter no more than 100 million pounds per year (in units of LWK) must achieve the following performance standards:

Performance Standards

[NSPS]

Regulated parameter	Maximum daily¹	Maximum monthly avg.¹
Ammonia (as N)	8.0	4.0
BOD ₅	26	16
Fecal Coliform	(²)	(³)
O&G (as HEM)	14	8.0
TSS	30	20

¹mg/L (ppm).

²Maximum of 400 MPN or CFU per 100 mL at any time.

³No maximum monthly average limitation.

(b) Facilities that slaughter more than 100 million pounds per year (in units of LWK) must achieve the following performance standards:

Performance Standards

[NSPS]

Regulated parameter	Maximum daily¹	Maximum monthly avg.¹
----------------------------	----------------------------------	---

Ammonia (as N)	8.0	4.0
BOD ₅	26	16
Fecal Coliform	(²)	(³)
O&G (as HEM)	14	8.0
TSS	30	20
Total Nitrogen	147	103

¹mg/L (ppm).

²Maximum of 400 MPN or CFU per 100 mL at any time.

³No maximum monthly average limitation.

§432.116 Pretreatment standards for new sources (PSNS). [Reserved]

§432.117 Effluent limitations attainable by the application of the best control technology for conventional pollutants (BCT).

Except as provided in [40 CFR 125.30](#) through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BCT: Limitations for BOD₅, TSS, O&G (as HEM), and fecal coliform are the same as the corresponding limitation specified in §432.112.

**Attachment E: Facility Effluent Data Outfall 001
(Water Quality Criteria Monitoring and Application Data)**

ATTACHMENT A
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY CRITERIA MONITORING

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
METALS						
7440-36-0	Antimony, dissolved	(3)	1.4	< 0.0014 mg/l	G or C	1/5 YR
7440-38-2	Arsenic, dissolved	(3)	1.0	< 0.001 mg/l	G or C	1/5 YR
7440-43-9	Cadmium, dissolved	(3)	0.30	< 0.003 mg/l	G or C	1/5 YR
16065-83-1	Chromium III, dissolved ⁽⁸⁾	(3)	3.6	< 0.0036 mg/l	G or C	1/5 YR
18540-29-9	Chromium VI, dissolved ⁽⁸⁾	(3)	1.6	< 0.0016 mg/l	G or C	1/5 YR
7440-50-8	Copper, dissolved	(3)	0.50	< 0.0005 mg/l	G or C	1/5 YR
7439-92-1	Lead, dissolved	(3)	0.50	< 0.0005 mg/l	G or C	1/5 YR
7439-97-6	Mercury, dissolved	(3)	1.0	< 0.0002 mg/l	G or C	1/5 YR
7440-02-0	Nickel, dissolved	(3)	0.94	< 0.00094 mg/l	G or C	1/5 YR
7782-49-2	Selenium, Total Recoverable	(3)	2.0	< 0.002 mg/l	G or C	1/5 YR
7440-22-4	Silver, dissolved	(3)	0.20	< 0.0002 mg/l	G or C	1/5 YR
7440-28-0	Thallium, dissolved	(4)	(5)	< 0.002 mg/l	G or C	1/5 YR
7440-66-6	Zinc, dissolved	(3)	3.6	< 0.0036 mg/l	G or C	1/5 YR
PESTICIDES/PCB'S						
309-00-2	Aldrin	608	0.05	<.05 ug/l	G or C	1/5 YR
57-74-9	Chlordane	608	0.2	<.20 ug/l	G or C	1/5 YR
2921-88-2	Chlorpyrifos (synonym = Dursban)	622	(5)	< 0.2 ug/l	G or C	1/5 YR
72-54-8	DDD	608	0.1	< .10 ug/l	G or C	1/5 YR
72-55-9	DDE	608	0.1	< .10 ug/l	G or C	1/5 YR
50-29-3	DDT	608	0.1	< .10 ug/l	G or C	1/5 YR
8065-48-3	Demeton	(4)	(5)	< 1 ug/l	G or C	1/5 YR
333-41-5	Diazinon	(4)	(5)	< 1 ug/l	G or C	1/5 YR
60-57-1	Dieldrin	608	0.1	< .10 ug/l	G or C	1/5 YR
959-98-8	Alpha-Endosulfan	608	0.1	< .10 ug/l	G or C	1/5 YR
33213-65-9	Beta-Endosulfan	608	0.1	< .10 ug/l	G or C	1/5 YR
1031-07-8	Endosulfan Sulfate	608	0.1	< .10 ug/l	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
72-20-8	Endrin	608	0.1	< .10 ug/l	G or C	1/5 YR
7421-93-4	Endrin Aldehyde	(4)	(5)	< .10 ug/l	G or C	1/5 YR
86-50-0	Guthion	622	(5)	< 1 ug/l	G or C	1/5 YR
76-44-8	Heptachlor	608	0.05	< .10 ug/l	G or C	1/5 YR
1024-57-3	Heptachlor Epoxide	(4)	(5)	< .10 ug/l	G or C	1/5 YR
319-84-6	Hexachlorocyclohexane Alpha-BHC	608	(5)	< .05 ug/l	G or C	1/5 YR
319-85-7	Hexachlorocyclohexane Beta-BHC	608	(5)	< .05 ug/l	G or C	1/5 YR
58-89-9	Hexachlorocyclohexane Gamma-BHC or Lindane	608	(5)	< .05 ug/l	G or C	1/5 YR
143-50-0	Kepone	(9)	(5)	< .10 ug/l	G or C	1/5 YR
121-75-5	Malathion	(4)	(5)	< 1 ug/l	G or C	1/5 YR
72-43-5	Methoxychlor	(4)	(5)	< .10 ug/l	G or C	1/5 YR
2385-85-5	Mirex	(4)	(5)	< .10 ug/l	G or C	1/5 YR
56-38-2	Parathion	(4)	(5)	< 1 ug/l	G or C	1/5 YR
1336-36-3	PCB Total	608	7.0	< 1.0 ug/l	G or C	1/5 YR
8001-35-2	Toxaphene	608	5.0	< 5.0 ug/l	G or C	1/5 YR
BASE NEUTRAL EXTRACTABLES						
83-32-9	Acenaphthene	625	10.0	< 10 ug/l	G or C	1/5 YR
120-12-7	Anthracene	625	10.0	< 10 ug/l	G or C	1/5 YR
92-87-5	Benzidine	(4)	(5)	< 10 ug/l	G or C	1/5 YR
56-55-3	Benzo (a) anthracene	625	10.0	< 10 ug/l	G or C	1/5 YR
205-99-2	Benzo (b) fluoranthene	625	10.0	< 10 ug/l	G or C	1/5 YR
207-08-9	Benzo (k) fluoranthene	625	10.0	< 10 ug/l	G or C	1/5 YR
50-32-8	Benzo (a) pyrene	625	10.0	< 10 ug/l	G or C	1/5 YR
111-44-4	Bis 2-Chloroethyl Ether	(4)	(5)	< 10 ug/l	G or C	1/5 YR
108-60-1	Bis 2-Chloroisopropyl Ether	(4)	(5)	< 10 ug/l	G or C	1/5 YR
85-68-7	Butyl benzyl phthalate	625	10.0	< 10 ug/l	G or C	1/5 YR
91-58-7	2-Chloronaphthalene	(4)	(5)	< 10 ug/l	G or C	1/5 YR
218-01-9	Chrysene	625	10.0	< 10 ug/l	G or C	1/5 YR
53-70-3	Dibenz(a,h)anthracene	625	20.0	< 10 ug/l	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
84-74-2	Dibutyl phthalate (synonym = Di-n-Butyl Phthalate)	625	10.0	< 10 ug/l	G or C	1/5 YR
95-50-1	1,2-Dichlorobenzene	624	10.0	< 5.0 ug/l	G or C	1/5 YR
541-73-1	1,3-Dichlorobenzene	624	10.0	< 5.0 ug/l	G or C	1/5 YR
106-46-7	1,4-Dichlorobenzene	624	10.0	< 5.0 ug/l	G or C	1/5 YR
91-94-1	3,3-Dichlorobenzidine	(4)	(5)	< 10 ug/l	G or C	1/5 YR
84-66-2	Diethyl phthalate	625	10.0	< 10 ug/l	G or C	1/5 YR
117-81-7	Bis-2-ethylhexyl phthalate	625	10.0	< 10 ug/l	G or C	1/5 YR
131-11-3	Dimethyl phthalate	(4)	(5)	< 10 ug/l	G or C	1/5 YR
121-14-2	2,4-Dinitrotoluene	625	10.0	< 10 ug/l	G or C	1/5 YR
122-66-7	1,2-Diphenylhydrazine	(4)	(5)	< 10 ug/l	G or C	1/5 YR
206-44-0	Fluoranthene	625	10.0	< 10 ug/l	G or C	1/5 YR
86-73-7	Fluorene	625	10.0	< 10 ug/l	G or C	1/5 YR
118-74-1	Hexachlorobenzene	(4)	(5)	< 10 ug/l	G or C	1/5 YR
87-68-3	Hexachlorobutadiene	(4)	(5)	< 10 ug/l	G or C	1/5 YR
77-47-4	Hexachlorocyclopentadiene	(4)	(5)	< 10 ug/l	G or C	1/5 YR
67-72-1	Hexachloroethane	(4)	(5)	< 10 ug/l	G or C	1/5 YR
193-39-5	Indeno(1,2,3-cd)pyrene	625	20.0	< 10 ug/l	G or C	1/5 YR
78-59-1	Isophorone	625	10.0	< 10 ug/l	G or C	1/5 YR
98-95-3	Nitrobenzene	625	10.0	< 10 ug/l	G or C	1/5 YR
62-75-9	N-Nitrosodimethylamine	(4)	(5)	< 10 ug/l	G or C	1/5 YR
621-64-7	N-Nitrosodi-n-propylamine	(4)	(5)	< 10 ug/l	G or C	1/5 YR
86-30-6	N-Nitrosodiphenylamine	(4)	(5)	< 10 ug/l	G or C	1/5 YR
129-00-0	Pyrene	625	10.0	< 10 ug/l	G or C	1/5 YR
120-82-1	1,2,4-Trichlorobenzene	625	10.0	< 10 ug/l	G or C	1/5 YR
VOLATILES						
107-02-8	Acrolein	(4)	(5)	< 5.0 ug/l	G	1/5 YR
107-13-1	Acrylonitrile	(4)	(5)	< 5.0 ug/l	G	1/5 YR
71-43-2	Benzene	624	10.0	< 5.0 ug/l	G	1/5 YR
75-25-2	Bromoform	624	10.0	< 5.0 ug/l	G	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
56-23-5	Carbon Tetrachloride	624	10.0	< 5.0 ug/l	G	1/5 YR
108-90-7	Chlorobenzene (synonym = monochlorobenzene)	624	50.0	< 5.0 ug/l	G	1/5 YR
124-48-1	Chlorodibromomethane	624	10.0	< 5.0 ug/l	G	1/5 YR
67-66-3	Chloroform	624	10.0	< 5.0 ug/l	G	1/5 YR
75-09-2	Dichloromethane (synonym = methylene chloride)	624	20.0	< 5.0 ug/l	G	1/5 YR
75-27-4	Dichlorobromomethane	624	10.0	< 5.0 ug/l	G	1/5 YR
107-06-2	1,2-Dichloroethane	624	10.0	< 5.0 ug/l	G	1/5 YR
75-35-4	1,1-Dichloroethylene	624	10.0	< 5.0 ug/l	G	1/5 YR
156-60-5	1,2-trans-dichloroethylene	(4)	(5)	< 5.0 ug/l	G	1/5 YR
78-87-5	1,2-Dichloropropane	(4)	(5)	< 5.0 ug/l	G	1/5 YR
542-75-6	1,3-Dichloropropene	(4)	(5)	< 5.0 ug/l	G	1/5 YR
100-41-4	Ethylbenzene	624	10.0	< 5.0 ug/l	G	1/5 YR
74-83-9	Methyl Bromide	(4)	(5)	< 5.0 ug/l	G	1/5 YR
79-34-5	1,1,2,2-Tetrachloroethane	(4)	(5)	< 5.0 ug/l	G	1/5 YR
127-18-4	Tetrachloroethylene	624	10.0	< 5.0 ug/l	G	1/5 YR
10-88-3	Toluene	624	10.0	< 5.0 ug/l	G	1/5 YR
79-00-5	1,1,2-Trichloroethane	(4)	(5)	< 5.0 ug/l	G	1/5 YR
79-01-6	Trichloroethylene	624	10.0	< 5.0 ug/l	G	1/5 YR
75-01-4	Vinyl Chloride	624	10.0	< 5.0 ug/l	G	1/5 YR
RADIONUCLIDES						
	Uranium	(4)	(5)	0.00 +/- 0.00 pCi/L	G or C	1/5 YR
	Combined Radium 226 and 228	(4)	(5)	0.20 +/- 0.52 pCi/L	G or C	1/5 YR
	Beta Particle & Photon Activity (mrem/yr)	(4)	(5)	46.3 +/- 1.7 pCi/L	G or C	1/5 YR
	Gross Alpha Particle Activity (pCi/L)	(4)	(5)	1.3 +/- 1.3 pCi/L	G or C	1/5 YR
ACID EXTRACTABLES ⁽⁶⁾						
95-57-8	2-Chlorophenol	625	10.0	<10 ug/l	G or C	1/5 YR
120-83-2	2,4 Dichlorophenol	625	10.0	<10 ug/l	G or C	1/5 YR
105-67-9	2,4 Dimethylphenol	625	10.0	<10 ug/l	G or C	1/5 YR
51-28-5	2,4-Dinitrophenol	(4)	(5)	<10 ug/l	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
534-52-1	2-Methyl-4,6-Dinitrophenol	(4)	(5)	<10 ug/l	G or C	1/5 YR
25154-52-3	Nonylphenol	(5)	(5)	<10 ug/l	G or C	1/5 YR
87-86-5	Pentachlorophenol	625	50.0	<10 ug/l	G or C	1/5 YR
108-95-2	Phenol	625	10.0	<10 ug/l	G or C	1/5 YR
88-06-2	2,4,6-Trichlorophenol	625	10.0	<10 ug/l	G or C	1/5 YR
MISCELLANEOUS						
776-41-7	Ammonia as NH3-N	350.1	200	0.79 mg/l	C	1/5 YR
16887-00-6	Chlorides	(4)	(5)	168.6 mg/l	C	1/5 YR
7782-50-5	Chlorine, Total Residual	(4)	100	< QL	G	1/5 YR
57-12-5	Cyanide, Free	(4)	10.0	< 0.01 mg/l	G	1/5 YR
N/A	<i>E. coli</i> / <i>Enterococcus</i> (N/CML)	(4)	(5)	396.8 / 2.0 MPN/100ml	G	1/5 YR
7783-06-4	Hydrogen Sulfide	(5)	(5)	.40 mg/l	G	1/5 YR
60-10-5	Tributyltin ⁽⁷⁾	NBSR 85-3295	(5)	< 30 ng/l	G or C	1/5 YR
	Hardness (mg/L as CaCO ₃)	(4)	(5)	426 mg/l as CaCO ₃	G or C (10)	1/5 YR

Tommy WATERS, Complex MANAGER

Name of Principal Exec. Officer or Authorized Agent/Title

[Signature] complex environmental mgr.

Signature of Principal Officer or Authorized Agent/Date

6/16/10

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. Sec. 1001 and 33 U.S.C. Sec. 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years.)

FOOTNOTES:

- (1) Quantification level (QL) is defined as the lowest concentration used for the calibration of a measurement system when the calibration is in accordance with the procedures published for the required method.

The quantification levels indicated for the metals are actually Specific Target Values developed for this permit. The Specific Target Value is the approximate value that may initiate a wasteload allocation analysis. Target values are not wasteload allocations or effluent limitations. The Specific Target Values are subject to change based on additional information such as hardness data, receiving stream flow, and design flows.

Units for the quantification level are micrograms/liter unless otherwise specified.

Quality control and quality assurance information shall be submitted to document that the required quantification level has been attained.

(2) Sample Type

G = Grab = An individual sample collected in less than 15 minutes. Substances specified with "grab" sample type shall only be collected as grabs. The permittee may analyze multiple grabs and report the average results provided that the individual grab results are also reported. For grab metals samples, the individual samples shall be filtered and preserved immediately upon collection.

C = Composite = A 24-hour (PW - Revise as required to require same composite duration as BOD₅) composite unless otherwise specified. The composite shall be a combination of individual samples, taken proportional to flow, obtained at hourly or smaller time intervals. The individual samples may be of equal volume for flows that do not vary by +/- 10 percent over a 24-hour period.

- (3) A specific analytical method is not specified; however a target value for each metal has been established. An appropriate method to meet the target value shall be selected from the following list of EPA methods (or any approved method presented in 40 CFR Part 136). If the test result is less than the method QL, a "<[QL]" shall be reported where the actual analytical test QL is substituted for [QL].


<u>Metal</u>	<u>Analytical Method</u>
Antimony	1638; 1639
Arsenic	206.5; 1632
Chromium ⁽⁸⁾	1639
Cadmium	1637; 1638; 1639; 1640
Chromium VI	218.6; 1639
Copper	1638; 1640
Lead	1637; 1638; 1640
Mercury	245.7; 1631
Nickel	1638; 1639; 1640
Selenium	1638; 1639
Silver	1638
Zinc	1638; 1639

- (4) Any approved method presented in 40 CFR Part 136.
- (5) The QL is at the discretion of the permittee. For any substances addressed in 40 CFR Part 136, the permittee shall use one of the approved methods in 40 CFR Part 136.
- (6) Testing for phenols requires continuous extraction.
- (7) Analytical Methods: NBSR 85-3295 or DEQ's approved analysis for Tributyltin may also be used [See A Manual for the Analysis of Butyltins in Environmental Systems by the Virginia Institute of Marine Science, dated November 1996].
- (8) Both Chromium III and Chromium VI may be measured by the total chromium analysis. If the result of the total chromium analysis is less than or equal to the lesser of the Chromium III or Chromium VI method QL, the results for both Chromium III and Chromium VI can be reported as "<[QL]", where the actual analytical test QL is substituted for [QL].
- (9) The lab may use SW846 Method 8270D provided the lab has an Initial Demonstration of Capability, has passed a PT for Kepone, and meets the acceptance criteria for Kepone as given in Method 8270D
- (10) The sample type for Hardness (as CaCO₃) shall match the sample type selected for Dissolved Metals.

**DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY CRITERIA MONITORING
Additional Parameters (Pending Approval. . .)**

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
METALS						
7782-49-2	Selenium, Total Recoverable	(3)	(Insert target value)	0.089 mg/l	G or C	1/5 YR
PESTICIDES/PCB'S						
333-41-5	Diazinon	(5)	(5)	< 1 ug/l	G or C	1/5 YR
ACID EXTRACTABLES⁽⁶⁾						
25154-52-3	Nonylphenol	(5)	(5)	< 10 ug/l	G or C	1/5 YR

Tommy WATERS, Complex Mgr
Name of Principal Exec. Officer or Authorized Agent/Title

 complex Environmental mgr 6/16/10
Signature of Principal Officer or Authorized Agent/Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. Sec. 1001 and 33 U.S.C. Sec. 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years.)

FOOTNOTES:

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Units for the quantification level are micrograms/liter unless otherwise specified.

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- (2) Sample Type

G = Grab = An individual sample collected in less than 15 minutes. Substances specified with "grab" sample type shall only be collected as grabs. The permittee may analyze multiple grabs and report

the average results provided that the individual grab results are also reported. For grab metals samples, the individual samples shall be filtered and preserved immediately upon collection.

C = Composite = A 24-hour (PW - Revise as required to require same composite duration as BOD₅) composite unless otherwise specified. The composite shall be a combination of individual samples, taken proportional to flow, obtained at hourly or smaller time intervals. The individual samples may be of equal volume for flows that do not vary by +/- 10 percent over a 24-hour period.

- (3) A specific analytical method is not specified; however a target value for each metal has been established. An appropriate method to meet the target value shall be selected from the following list of EPA methods (or any approved method presented in 40 CFR Part 136). If the test result is less than the method QL, a "<[QL]" shall be reported where the actual analytical test QL is substituted for [QL].

<u>Metal</u>	<u>Analytical Method</u>
Selenium	1638; 1639

- (4) Any approved method presented in 40 CFR Part 136.
- (5) The QL is at the discretion of the permittee. For any substances addressed in 40 CFR Part 136, the permittee shall use one of the approved methods in 40 CFR Part 136.
- (6) Testing for phenols requires continuous extraction.

Outfall 001	Flow		pH		BOD ₅			Total Suspended Solids (TSS)			
	(MGD)		(SU)		(kg/d)	(mg/L)		(kg/d)	(mg/L)		
Due Date	MO AVG	MAX	MIN	MAX	MO AVG	MO AVG	MAX	MO AVG	MO AVG	MAX	
10-Jun-2010	0.757	1.18	6.3	7.6	<QL	<QL	<QL	5.01	1.9	3.4	
10-Jul-2010	0.702	1.389	6.5	7.2	0.9	0.9	5.5	5.23	2.3	4.9	
10-Aug-2010	0.84	1.614	6.7	8.2	<QL	<QL	<QL	10.71	3.6	4.9	
10-Sep-2010	0.67	1.325	6.5	7.6	<QL	<QL	<QL	7.77	3	4.4	
10-Oct-2010	0.777	1.591	6.3	7.7	<QL	<QL	<QL	15.03	4.8	21.5	
10-Nov-10	0.793	1.969	6.1	7.6	<QL	<QL	<QL	6.46	2.1	4.9	
10-Dec-10	0.742	1.887	6.4	7.1	1.25	0.4	5.1	9.2	2.9	5	
10-Jan-11	0.822	1.743	6.1	8.9	10.13	3.1	6.4	16.31	5	6.1	
10-Feb-11	0.902	1.936	6.3	7.8	1.71	0.6	5.2	7.67	2.6	5.1	
10-Mar-11	0.735	1.304	6.6	7.6	<QL	<QL	<QL	8.93	3	4.6	
10-Apr-11	1.034	1.937	6.5	7.2	3.42	0.8	5.5	15.72	3.8	5.5	
10-May-11	0.857	1.543	6.4	8.5	1.96	0.5	5.6	15.58	4	5.5	
10-Jun-11	0.777	1.519	6.9	7.6	<QL	<QL	<QL	9.65	3	4.7	
10-Jul-11	0.696	1.998	7.1	8.9	<QL	<QL	<QL	8.5	3	6.2	
10-Aug-11	0.691	1.072	6.1	8.25	<QL	<QL	<QL	6.36	2.5	4.1	
10-Sep-11	0.798	1.275	6.3	7.8	<QL	<QL	<QL	8.99	2.6	5.4	
10-Oct-11	0.812	1.43	6.4	8	<QL	<QL	<QL	10.78	3.2	7	
10-Nov-11	0.752	1.511	6.2	7.5	3.07	0.877	5.7	6.47	2	4.8	
10-Dec-11	0.748	1.429	5.2	6.6	3.48	1.3	5.8	10.47	3.9	6.8	
10-Jan-12	0.841	2.69	5.17	7.5	3.68	1.1	6.8	7.55	2.3	4.8	
10-Feb-12	0.632	1.21	6.03	7.4	6.59	2.22	8.4	6.29	2.1	3.6	
10-Mar-12	0.822	2.209	6.57	7.17	4.09	1.21	4.8	6.01	1.78	3.2	
10-Apr-12	0.687	1.044	6.13	7.11	6.11	1.94	6.7	5.71	1.95	3	
10-May-12	0.563	0.852	6.03	7.4	0.84	0.41	4.9	3.29	1.34	2	
10-Jun-12	0.613	0.939	6.54	7.19	2.5	0.86	5.9	3.7	1.32	2.3	
10-Jul-12	0.53	0.854	6.98	7.39	1.2	0.65	8.4	2.69	1.34	2.5	
10-Aug-12	0.497	0.79	6.43	7.54	1.83	0.93	4.3	3.16	1.6	3.4	
10-Sep-12	0.542	0.795	7.01	7.62	<QL	<QL	<QL	4.7	2.19	4.6	
10-Oct-12	0.49	0.697	7.1	7.63	<QL	<QL	<QL	2.63	1.98	14.3	
10-Nov-12	0.494	0.782	6.48	7.68	<QL	<QL	<QL	2.45	1.32	11.9	
10-Dec-12	0.558	0.719	6.64	7.1	4.51	1.82	5.7	8.03	3.31	6.8	
10-Jan-13	0.529	0.746	6.52	7.17	1.03	0.47	2.9	4.3	1.68	7.3	
10-Feb-13	0.578	0.874	6.74	7.5	<QL	<QL	<QL	4.01	1.69	2.8	
10-Mar-13	0.64	1	6.43	7.14	<QL	<QL	<QL	3.89	1.48	3.9	

10-Apr-13	0.669	0.963	6.5	7.28	<QL	<QL	<QL	109.29	46.92	575	
10-May-13	0.644	0.932	6.39	7.08	<QL	<QL	<QL	5.26	1.93	4.2	
AVG	0.701	1.326	6.41	7.57	1.6	0.6	2.9	10.2	3.8	21.4	
90th percentile	0.841	1.953	6.94	8.23	4.3	1.6	6.6	15.3	4.0	9.6	
10th percentile	0.530	0.786	6.07	7.11	<QL	<QL	<QL	3.2	1.4	2.9	
Minimum	0.490	0.697	5.17	6.60	<QL	<QL	<QL	2.5	1.3	2.0	
Maximum	1.034	2.690	7.10	8.90	10.1	3.1	8.4	109.3	46.9	575.0	

	TRC		Fecal Coliform		DO	Total Photphorus (TP)					
	(µg/L)		(#/100ml)		(mg/L)	(kg/d)		(mg/L)		(kg/cal Y)	
	MO AVG	MAX	MO AVG	MAX	MIN	MO AVG	MAX	MO AVG	MAX	MAX	
	<QL	<QL	1	2	7.4	0.05	1.03	0.02	0.23	49	
	<QL	<QL	8	8	8.09	0.29	1.24	0.13	0.39	58	
	<QL	<QL	<QL	<QL	6.43	0.34	1.77	0.11	0.32	68	
	<QL	<QL	4.5	9	5.24	0.51	1.89	0.2	0.48	84	
	<QL	<QL	<QL	<QL	6.63	1.5	3.61	0.51	1.1	130	
	<QL	<QL	1.33	4	6.94	0.33	1.64	0.11	0.42	140	
	<QL	<QL	<QL	<QL	7.59	0.41	2	0.13	0.44	152	
	<QL	<QL	8	30	7.58	0.7	1.98	0.22	0.38	17.4	
	<QL	<QL	<QL	<QL	6.28	0.35	1.46	0.12	0.38	8	
	<QL	<QL	3.25	13	6.68	0.37	1.21	0.12	0.32	NA	
	<QL	<QL	1.2	4	7.23	1.08	1.39	0.25	0.497	33	
	<QL	<QL	1	2	6.84	1.02	2.9	0.26	0.43	57	
	<QL	<QL	1.5	4	6	0.92	2.32	0.29	0.49	86	
	<QL	<QL	28.8	90	5.62	0.69	2.19	0.24	0.47	104	
	<QL	<QL	9.5	17	5.47	0.16	1.23	0.06	0.31	108	
	<QL	<QL	121	300	7.9	0.2	0.9	0.06	0.19	113	
	<QL	<QL	36	140	7.56	0.83	1.92	0.24	0.47	138	
	<QL	<QL	0.5	2	6.11	0.7	0.93	0.12	0.21	150	
	<QL	<QL	40.8	130	7.46	0.5	1.84	0.18	0.34	163	
	1	16	5.67	17	8.17	0.7	1.95	0.21	0.49	181.9	
	<QL	<QL	87.5	350	6.26	0.42	0.71	0.14	0.19	13	
	<QL	<QL	34	170	8.61	0.77	1.86	0.22	0.31	35	
	<QL	<QL	2	4	8.05	0.62	1.5	0.23	0.47	54.41	
	<QL	<QL	2	4	8.04	0.2	0.33	0.08	0.13	60.44	
	<QL	<QL	<QL	<QL	7.73	0.2	0.35	0.08	0.11	67.06	
	<QL	<QL	1	2	7.79	0.36	0.67	0.17	0.3	77.65	
	<QL	<QL	<QL	<QL	7.21	0.4	0.69	0.2	0.29	90.13	
	<QL	<QL	<QL	<QL	6.74	0.44	0.71	0.21	0.4	103.64	
	<QL	<QL	<QL	<QL	6.69	0.44	0.77	0.24	0.79	116.75	
	<QL	<QL	<QL	<QL	7.03	0.41	1.25	0.2	0.75	129.33	
	<QL	<QL	<QL	<QL	7.29	0.28	0.56	0.12	0.22	137.85	
	<QL	<QL	22	22	5.25	0.18	0.34	0.07	0.14	143.38	
	<QL	<QL	<QL	<QL	6.53	0.3	0.55	0.13	0.2	9.21	
	<QL	<QL	<QL	<QL	9.25	0.58	0.87	0.23	0.34	24.64	

	<QL	<QL	<QL	<QL	8.71	0.61	0.95	0.22	0.34	43.49	
	<QL	<QL	<QL	<QL	8.04	0.37	0.55	0.15	0.28	54.54	
AVG	0.03	0.44	12	37	7.12	0.51	1.34	0.17	0.38	85.7	
90th percentile	<QL	<QL	35	135	8.13	0.88	2.10	0.25	0.49	147.4	
10th percentile	<QL	<QL	<QL	<QL	5.81	0.20	0.55	0.08	0.19	20.3	
Minimum	<QL	<QL	<QL	<QL	5.24	0.05	0.33	0.02	0.11	8.0	
Maximum	1.00	16.00	121	350	9.25	1.50	3.61	0.51	1.10	181.9	

	Total Nitrogen (TN)				Ammonia (NH ₃)				TKN		
	(kg/d)		(mg/L)		(kg/d)		(mg/L)		(kg/d)	(mg/L)	
	MO AVG	MAX	MO AVG	MAX	MO AVG	MAX	MO AVG	MAX	MO AVG	MO AVG	
	7.86	15.72	2.32	4.64	1.98	5.94	0.7	1.33	1.64	1.34	
	4.9	9.8	2.92	4.84	1.64	4.01	0.7	1.26	0.53	0.66	
	12.16	14.36	3.54	3.59	5.25	32.22	1.8	5.76	2.24	1.46	
	21.97	37.58	11.06	19.62	2.54	15.88	1	4	0.85	0.84	
	107	131	36	43	1.21	1.85	0.4	0.54	<QL	<QL	
	43.47	84.76	15.36	30.1	<1.52	<1.95	<.5	<.5	0.35	0.25	
	17.68	32.85	5.77	12.6	2.24	10.9	0.7	2.41	6.18	1.93	
	9.93	21.78	3.12	6.6	4.61	18.16	1.4	3.51	5.71	2.28	
	10.73	17.03	3.87	6.18	2.06	5.93	0.7	1.55	2.1	0.73	
	17.67	25.32	5.75	6.92	<1.5	<1.9	<0.5	<0.5	4.64	1.48	
	12.21	27.41	2.44	4.2	3.82	36	0.9	4.91	8.44	1.54	
	20.59	45.12	4.7	8.89	4.12	18.97	1.1	5.69	5.51	1.37	
	17.68	5.42	5.42	13.23	5.64	21.53	1.8	4.54	2.95	1.14	
	18.28	43.05	6.33	12.5	2.87	24.73	1	4.54	5.04	1.85	
	3.97	8.9	1.94	4.38	2.26	12.3	0.9	3.1	1.44	0.84	
	32.35	45.85	9.85	11.97	<1.71	<2.14	<0.5	<0.5	2.29	0.65	
	24.03	30.31	7.48	8.96	<1.42	<2.06	<0.04	<0.5	4.12	1.66	
	29.93	43.09	8.65	10.79	<QL	<QL	<QL	<QL	1.05	0.47	
	23.23	43.27	6.59	11.56	0.51	5.63	0.2	1.04	4.14	1.02	
	20.24	36.27	6.12	11.56	0.69	9.252	0.2	2.31	1.5	0.8	
	8.46	42.32	7.09	14.75	0.08	0.22	<QL	0.06	4.59	2.55	
	17.192	31.168	5.932	9.17	0.204	0.932	0.053	0.18	2.302	0.78	
	18.94	32.24	6.38	10.25	0.11	0.37	0.04	0.2	1.48	0.5	
	20.76	29.4	8.14	10.86	0.06	0.15	0.03	0.09	0.73	0.28	
	21.53	28.81	7.4	9.42	0.08	0.5	0.03	0.2	<QL	<QL	
	20.36	21.68	7.79	8.3	0.08	0.46	0.04	0.18	1.96	0.75	
	13.75	15.34	7.23	9.32	0.03	0.07	0.02	0.03	0.64	0.3	
	9.1	10.28	5.57	6.2	0.03	0.06	0.02	0.03	1.01	0.62	
	12.73	14.96	6.02	6.47	<QL	<QL	<QL	<QL	1.91	0.91	
	19.82	21.51	9.65	10.92	<QL	<QL	<QL	<QL	1.56	0.78	
	15.61	17.17	7.46	7.83	<QL	<QL	<QL	<QL	1.95	0.97	
	25.02	28.08	10.23	11.7	<QL	<QL	<QL	<QL	2.62	1.07	
	21.97	23.08	9.64	11.57	1.87	10.82	0.72	3.96	1.61	0.67	
	21.42	24.29	9.55	10	1.19	11.62	0.35	3.07	<QL	<QL	

	23.92	29.01	8.58	10.5	0.27	0.3	0.1	0.1	0.45	0.16	
	18.56	20.08	6.98	7.6	0.26	0.35	0.1	0.1	1.33	0.5	
AVG	20.70	30.79	7.58	10.86	1.44	7.14	0.46	1.57	2.36	0.92	
90th percentile	27.48	44.20	10.04	13.99	3.97	20.25	1.05	4.54	5.28	1.76	
10th percentile	8.78	12.32	3.02	4.74	<QL	<QL	<QL	<QL	0.40	0.21	
Minimum	3.97	5.42	1.94	3.59	<QL	<QL	<QL	<QL	<QL	<QL	
Maximum	107.00	131.00	36.00	43.00	5.64	36.00	1.80	5.76	8.44	2.55	

	Settleable Solids		<i>E. coli</i>		Zinc, Total		Nitrate plus Nitrite				
	(ml/L)		Geometric Mean (n/100 ml)		(µg/L)		(kg/d)	(mg/L)			
	MO AVG	MAX	MO AVG	MAX	MO AVG	MAX	MO AVG	MO AVG			
	0.01	0.01	99.7	396.8	<QL	<QL	2.24	1.65			
	0.01	0.01	6.36	31.8	<QL	<QL	9.03	11.29			
	0.01	0.01	1.7	3.1	<QL	<QL	4.23	NULL			
	0.01	0.01	0.25	1	<QL	<QL	7.93	10.22			
	0.01	0.01	0.8	2	<QL	<QL	107	36			
	0.01	0.01	<QL	<QL	<QL	<QL	17.83	15.68			
	0.01	0.01	0.25	1	<QL	<QL	6.74	2.01			
	0.01	0.01	9.48	35.9	<QL	<QL	2.8	0.85			
	0.01	0.01	<QL	<QL	<QL	<QL	8.63	3.14			
	0.01	0.01	1.28	3.1	<QL	<QL	13.03	4.27			
	0.01	0.01	0.8	3	<QL	<QL	3.77	0.9			
	0.01	0.01	0.75	2	<QL	<QL	15.09	3.33			
	0.01	0.01	1.53	3.1	<QL	<QL	11.2	4.28			
	0.01	0.01	45.96	151.5	<QL	<QL	13.23	4.48			
	0.01	0.01	4.9	9.8	0.313	1.25	1.73	1.1			
	0.01	0.01	121	325	<QL	<QL	30.07	9.19			
	0.01	0.01	29.05	107	<QL	<QL	15.1	6.02			
	<QL	<QL	<QL	<QL	<QL	<QL	22.89	8.3			
	<QL	<QL	17.48	79.2	12	62	19.09	5.56			
	<QL	<QL	5.33	16	6.33	19	18.74	9.41			
	<QL	<QL	<QL	<QL	<QL	<QL	3.87	5.99			
	<QL	<QL	1	4	<QL	<QL	14.89	5.15			
	<QL	<QL	3	8	<QL	<QL	17.46	5.89			
	<QL	<QL	2	5	<QL	<QL	20.02	7.87			
	<QL	<QL	33	161	<QL	<QL	21.53	7.4			
	<QL	<QL	0.25	1	<QL	<QL	18.4	7.04			
	<QL	<QL	1	3	<QL	<QL	13.11	6.93			
	<QL	<QL	0.4	1	<QL	<QL	8.09	4.95			
	<QL	X	<QL	<QL	<QL	<QL	10.82	5.11			
	<QL	<QL	0.4	1	<QL	<QL	17.49	8.49			
	<QL	<QL	<QL	<QL	<QL	<QL	13.66	6.5			
	<QL	<QL	<QL	<QL	36	36	22.4	9.16			
	<QL	<QL	<QL	<QL	32.1	32.1	20.36	8.97			
	<QL	<QL	<QL	<QL	33.8	33.8	21.42	9.55			

	<QL	<QL	<QL	<QL	35.6	35.6	23.47	8.42			
	<QL	<QL	<QL	<QL	49.2	49.2	17.23	6.48			
AVG	0.005	0.005	11	38	5.7	7.5	16.5	7.2			
90th percentile	0.01	0.01	31	129	33.0	34.7	22.6	10.0			
10th percentile	<QL	<QL	<QL	<QL	<QL	<QL	3.8	1.8			
Minimum	<QL	<QL	<QL	<QL	<QL	<QL	1.7	0.9			
Maximum	0.01	0.01	121	325	49.2	62.0	107.0	36.0			

	Oil&Grease			
	(kg/d)		(mg/L)	
	MO AVG	MAX	MO AVG	MAX
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	6.3	25.2	3.1	9.5
	16.68	30.92	7	10.5
	27.35	63.73	6.68	13.3
	33.39	64.97	10.13	12.8
	19.83	44.78	6.3	11.3
	<QL	<QL	<QL	<QL
	6.42	22.72	3.88	8.8
	7.32	29.83	2.68	8.2
	2.4	14.41	1.4	5.6
	<QL	<QL	<QL	<QL
	7.12	21.6	2.88	9
	<QL	<QL	<QL	<QL
	<QL	<QL	1.53	6.1
	3.87	19.35	1.42	7.1
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	7.45	29.82	2.85	11.4
	3.92	14.1	2.03	6.9
	3.71	18.57	1.42	7.1
	<QL	<QL	<QL	<QL
	1.79	8.97	1.08	5.4
	4.04	16.14	1.58	6.3
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL

	<QL	<QL	<QL	<QL
	<QL	<QL	<QL	<QL
AVG	4.2	11.8	1.6	3.9
90th percentile	12.1	30.4	5.1	10.9
10th percentile	<QL	<QL	<QL	<QL
Minimum	<QL	<QL	<QL	<QL
Maximum	33.4	65.0	10.1	13.3

Attachment F: MSTRANTI and Stats.exe

MSTRANTI DATA SOURCE REPORT

Stream information	
Mean Hardness	Same as effluent for discharge to dry ditch
90% Temperature (annual)	Same as effluent for discharge to dry ditch
90% Maximum pH	Same as effluent for discharge to dry ditch
10% Maximum pH	Same as effluent for discharge to dry ditch
Tier Designation	Tier Determination (Flow Frequency Memo)
Stream Flows	
All Data	Flow Frequency Memo (Fact Sheet Attachment A)
Mixing Information	
All Data	100% used for 0 MGD stream flows
Effluent Information	
Mean Hardness	Application –Water Quality Criteria Monitoring
90% Temperature (annual)	Application Form 2C
90% Maximum pH	DMR data
10% Maximum pH	DMR data
Discharge flow	Permit Application (Design Flow)

Data Location:

Attachment A: Flow Frequency Description

Attachment E: Facility Effluent Data (application and DMR data)

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: **Tyson Farms - Glen Allen**

Permit No.: **VA0004031**

Receiving Stream: **Chickahominy River, UT**

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	426 mg/L	1Q10 (Annual) =	0 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	426 mg/L
90% Temperature (Annual) =	26.9 deg C	7Q10 (Annual) =	0 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	26.9 deg C
90% Temperature (Wet season) =	26.9 deg C	30Q10 (Annual) =	0 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	26.9 deg C
90% Maximum pH =	8.23 SU	1Q10 (Wet season) =	0 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	8.23 SU
10% Maximum pH =	7.11 SU	30Q10 (Wet season) =	0 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	7.11 SU
Tier Designation (1 or 2) =	1	30Q5 =	0 MGD			Discharge Flow =	1.25 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	0 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	na	9.3E+00
Acrylonitrile ^C	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Aldrin ^C	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	5.0E-04
Ammonia-N (mg/l) (Yearly)	0	5.40E+00	7.69E-01	na	--	5.40E+00	7.69E-01	na	--	--	--	--	--	--	--	--	--	5.40E+00	7.69E-01	na	--
Ammonia-N (mg/l) (High Flow)	0	5.40E+00	7.69E-01	na	--	5.40E+00	7.69E-01	na	--	--	--	--	--	--	--	--	--	5.40E+00	7.69E-01	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	4.0E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	6.4E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene ^C	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+02
Benzidine ^C	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-03
Benzo (a) anthracene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (b) fluoranthene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (k) fluoranthene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (a) pyrene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Bis(2-Chloroethyl) Ether ^C	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+00
Bis(2-Chloroisopropyl) Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04
Bis 2-Ethylhexyl Phthalate ^C	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+01
Bromoform ^C	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Cadmium	0	1.9E+01	3.4E+00	na	--	1.9E+01	3.4E+00	na	--	--	--	--	--	--	--	--	--	1.9E+01	3.4E+00	na	--
Carbon Tetrachloride ^C	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+01
Chlordane ^C	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	8.1E-03
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane ^C	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+02
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	1.8E+03	2.3E+02	na	--	1.8E+03	2.3E+02	na	--	--	--	--	--	--	--	--	--	1.8E+03	2.3E+02	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene ^C	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-02
Copper	0	5.0E+01	2.9E+01	na	--	5.0E+01	2.9E+01	na	--	--	--	--	--	--	--	--	--	5.0E+01	2.9E+01	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	1.6E+04
DDD ^C	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	3.1E-03
DDE ^C	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	2.2E-03
DDT ^C	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	2.2E-03
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	1.7E-01	1.7E-01	na	--
Dibenz(a,h)anthracene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	1.3E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	9.6E+02
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	1.9E+02
3,3-Dichlorobenzidine ^C	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	2.8E-01
Dichlorobromomethane ^C	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+02
1,2-Dichloroethane ^C	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	--	--	na	7.1E+03
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	1.0E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	--	--	na	2.9E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane ^C	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
1,3-Dichloropropene ^C	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	2.1E+02
Dieldrin ^C	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	5.4E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	--	--	na	4.4E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	8.5E+02
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	1.1E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	4.5E+03
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	2.8E+02
2,4-Dinitrotoluene ^C	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	3.4E+01
Dioxin 2,3,7,8- tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	--	--	na	5.1E-08
1,2-Diphenylhydrazine ^C	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	2.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+01
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	6.0E-02
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	--	--	--	--	na	3.0E-01

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor ^C	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	7.9E-04
Heptachlor Epoxide ^C	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	3.9E-04
Hexachlorobenzene ^C	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-03
Hexachlorobutadiene ^C	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Hexachlorocyclohexane																					
Alpha-BHC ^C	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-02
Hexachlorocyclohexane																					
Beta-BHC ^C	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Hexachlorocyclohexane																					
Gamma-BHC ^C (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	1.8E+00
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Hexachloroethane ^C	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone ^C	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+03
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	6.9E+02	7.9E+01	na	--	6.9E+02	7.9E+01	na	--	--	--	--	--	--	--	--	--	6.9E+02	7.9E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
Methylene Chloride ^C	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	5.9E+02	6.5E+01	na	4.6E+03	5.9E+02	6.5E+01	na	4.6E+03	--	--	--	--	--	--	--	--	5.9E+02	6.5E+01	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+02
N-Nitrosodimethylamine ^C	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
N-Nitrosodiphenylamine ^C	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodi-n-propylamine ^C	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total ^C	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	6.4E-04
Pentachlorophenol ^C	0	9.7E+00	7.5E+00	na	3.0E+01	9.7E+00	7.5E+00	na	3.0E+01	--	--	--	--	--	--	--	--	9.7E+00	7.5E+00	na	3.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	--	--	--	--	2.0E+01	5.0E+00	na	4.2E+03
Silver	0	3.7E+01	--	na	--	3.7E+01	--	na	--	--	--	--	--	--	--	--	--	3.7E+01	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,1,2,2-Tetrachloroethane ^C	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	--	--	na	4.0E+01
Tetrachloroethylene ^C	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	--	--	na	4.7E-01
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	--	--	na	6.0E+03
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Toxaphene ^C	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	--	--	--	--	7.3E-01	2.0E-04	na	2.8E-03
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	4.6E-01	7.2E-02	na	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	--	--	na	7.0E+01
1,1,2-Trichloroethane ^C	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	--	--	na	1.6E+02
Trichloroethylene ^C	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	--	--	na	3.0E+02
2,4,6-Trichlorophenol ^C	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	--	--	na	2.4E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Vinyl Chloride ^C	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	--	--	na	2.4E+01
Zinc	0	3.8E+02	3.8E+02	na	2.6E+04	3.8E+02	3.8E+02	na	2.6E+04	--	--	--	--	--	--	--	--	3.8E+02	3.8E+02	na	2.6E+04

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 3Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)	Note: do not use QL's lower than the minimum QL's provided in agency guidance
Antimony	6.4E+02	
Arsenic	9.0E+01	
Barium	na	
Cadmium	2.0E+00	
Chromium III	1.4E+02	
Chromium VI	6.4E+00	
Copper	1.8E+01	
Iron	na	
Lead	4.7E+01	
Manganese	na	
Mercury	4.6E-01	
Nickel	3.9E+01	
Selenium	3.0E+00	
Silver	1.5E+01	
Zinc	1.5E+02	

Stats.exe Results

Facility = Tyson
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 5.4
WLAc = 0.769
Q.L. = .2
samples/mo. = 12
samples/wk. = 3

Summary of Statistics:

observations = 10
Expected Value = .146259
Variance = .007701
C.V. = 0.6
97th percentile daily values = .355910
97th percentile 4 day average = .243344
97th percentile 30 day average = .176396
< Q.L. = 8
Model used = BPJ Assumptions, Type 1 data
No Limit is required for this material

The data are (mg/L):

0.1
0.1
0.35
0.72
0.02
0.02
0.04
0.03
0.03
0.04

Based on this reasonable potential analysis utilizing 10 months of data from DMRs submitted from April 2012 through May 2013, no limit is required for ammonia.

Facility = Tyson
Chemical = Chloride, mg/L
Chronic averaging period = 4
WLAa = 860
WLAc = 230
Q.L. = 1
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 168.6
Variance = 10233.3
C.V. = 0.6
97th percentile daily values = 410.274
97th percentile 4 day average = 280.515
97th percentile 30 day average = 203.340
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data
A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 336.392200332243
Average Weekly limit = 336.392200332243
Average Monthly Limit = 336.392200332243

The data are:
168.6 (mg/L)

Based on data submitted with the application, a new chloride limit is required based on chronic toxicity. The limit will be expressed in the permit as 340 mg/L, with two significant figures, which is consistent with the number of significant figures in the underlying standard for the parameter.

Facility = Tyson
Chemical = Hydrogen Sulfide, $\mu\text{g/L}$
Chronic averaging period = 4
WLAa =
WLAc = 2
Q.L. = 1
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 400
Variance = 57600
C.V. = 0.6
97th percentile daily values = 973.367
97th percentile 4 day average = 665.516
97th percentile 30 day average = 482.421
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data
A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 2.92514956810646
Average Weekly limit = 2.92514956810646
Average Monthly Limit = 2.92514956810646

The data are:
400 $\mu\text{g/L}$

A reasonable potential analysis was performed using hydrogen sulfide data reported on the permit application. Based on this analysis, a limit is needed. However, a numeric hydrogen sulfide limitations is not inserted in this permit per the VPDES permit manual (GM 14-2003) section IN-3. Rather, a hydrogen sulfide minimization plan is required. Refer to the fact sheet for further details.

Facility = Tyson
Chemical = Zinc, dissolved
Chronic averaging period = 4
WLAa = 380
WLAc = 380
Q.L. = 2.9
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 190
Variance = 12996
C.V. = 0.6
97th percentile daily values = 462.349
97th percentile 4 day average = 316.120
97th percentile 30 day average = 229.150
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 380
Average Weekly limit = 380
Average Monthly Limit = 380

The data are:

190 $\mu\text{g/L}$

A reasonable potential analysis was performed using the existing limit for the data input and yielded the need for a limit based on acute toxicity. However, the limitation produced by Stats.exe was less stringent than that in the 2005 permit; therefore the zinc limitation is carried forward from the 2005 permit. The permittee reported a value of less than the QL for dissolved zinc on the application.

Facility = Tyson
Chemical = Selenium, Total Recoverable
Chronic averaging period = 4
WLAa = 20
WLAc = 5
Q.L. = 89
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 103.790
Variance = 3878.12
C.V. = 0.6
97th percentile daily values = 252.566
97th percentile 4 day average = 172.686
97th percentile 30 day average = 125.177
< Q.L. = 1
Model used = BPJ Assumptions, Type 1 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 7.31287392026615
Average Weekly limit = 7.31287392026615
Average Monthly Limit = 7.31287392026615

The data are:

<2 µg/L
89 µg/L

Two data points for total recoverable selenium were available from the application. One was less than the agency QL of 2 µg/L and is represented above with a "<" sign. A reasonable potential analysis using the censored data was performed in accordance with standard agency procedures and a total recoverable selenium limitation is needed based on chronic toxicity. The limit is rounded to two significant figures (7.3 µg/L).

Facility = Tyson
Chemical = TRC
Chronic averaging period = 4
WLAa = 19
WLAc = 11
Q.L. = 100
samples/mo. = 120
samples/wk. = 30

Summary of Statistics:

observations = 1
Expected Value = 20000
Variance = 1440000
C.V. = 0.6
97th percentile daily values = 48668.3
97th percentile 4 day average = 33275.8
97th percentile 30 day average = 24121.0
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 16.0883226245855
Average Weekly limit = 8.07095499768512
Average Monthly Limit = 7.29256193358323

The data are:
20000µg/L

A reasonable potential analysis was performed to generate a TRC limit for Part I.C.15 Additional TRC Limitations and Monitoring requirements in the permit. Per GM00-2011 a datum of 20,000 µg/L is used to force a TRC limit. A monthly average of 7.3 µg/L and a daily maximum of 16 µg/L is applied in the permit special condition. The special condition will only be activated if the facility utilizes chlorine disinfection instead of UV.

Facility = Tyson
Chemical = Cadmium, dissolved
Chronic averaging period = 4
WLAa = 19
WLAc = 3.4
Q.L. = 0.3
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025
97th percentile 4 day average = 4.99137
97th percentile 30 day average = 3.61815
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 4.97275426578099
Average Weekly limit = 4.97275426578099
Average Monthly Limit = 4.97275426578099

The data are:

3 µg/L

A reasonable potential analysis was performed for cadmium, which was reported as < 3.0 µg/L on the reissuance application. The agency accepted QL for cadmium is 0.3 µg/L, therefore for the purpose of this evaluation cadmium was considered present at a concentration equal to the lab QL of 3 µg/L. A new limitation is required based on chronic toxicity and is rounded to two significant figures (5.0 µg/L).

Attachment G: Groundwater Evaluation

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY *Piedmont Regional Office*

4949-A Cox Road, Glen Allen, VA 23060-6296

804/527-5020

SUBJECT: Tyson Foods, Inc. - Groundwater Evaluation

TO: File

FROM: Janine Howard

DATE: January 27, 2014

Process and Background:

Tyson Foods, Inc. located on Mountain Road in Hanover County is a poultry processing plant, involving slaughter, cut-up, and packaging for human consumption as well as poultry processing for pet food production. The facility is permitted as a minor industrial discharger. The discharge results from the operation of a 1.5 million gallon per day wastewater treatment plant. Components of the treatment system include screening, acidulation, extended aeration, an activated sludge basin with suspended growth for ammonia removal, a four-stage Bardenpho system for biological nutrient removal, tertiary filtering, and ultraviolet disinfection.

Groundwater Monitoring:

There are four monitoring wells on site that are actively sampled (see attached groundwater contour map). Groundwater flows east through the property. MW-1 is the background well and is located north of the processing plant. MW-2, MW-3, and MW-4 are the downgradient wells that were put in place to monitor the groundwater impacts of the original treatment lagoons on site. The lagoons were constructed in 1968 east of the processing plant using on-site soils and were not lined. During the early 1990's groundwater contamination down-gradient of the treatment lagoons was observed in MW-2, MW-3, and MW-4. On April 4, 1992 a Lagoon Closure Plan (see attached) was submitted to and approved by DEQ. The plan involved a groundwater recovery network of wells used to remove contaminated groundwater from the area in addition to draining, sludge volume reduction and eventual revegetation of the lagoons.

The groundwater monitoring plan approved in 1990 requires quarterly groundwater monitoring. Additionally, indefinite quarterly monitoring of the wells was deemed necessary in the January 9, 1992 approval letter for the groundwater remediation plan for the facility. With the closure of the lagoons in 1992, natural attenuation of the contaminant levels in the groundwater is expected to occur over time until the groundwater meets standards.

Quarterly groundwater data was used for this evaluation, derived from sampling events from 2005-2013. See the contour map following this report which includes the approximate locations of all monitoring wells.

The parameters assessed are ammonia-N, biochemical oxygen demand (BOD), chloride, chemical oxygen demand (COD), nitrite, nitrate, sulfate, total dissolved solids (TDS), total kjeldahl nitrogen (TKN), pH, specific conductance, copper, sodium, and zinc. The data were evaluated for normality using the DEQ Piedmont Regional Office, Groundwater Analysis Spreadsheet which employs the Shapiro- Wilk Test of Normality. Non-normal data were assessed using a non-parametric test of significance (Wilcoxon Rank Sum Test), while normal data was assessed for a

significant difference using Cochran's approximation to the Behrens-Fisher Student's t-test with a 5% level of significance. The statewide groundwater standards applicable to this facility are listed in Table I. The facility falls in the Piedmont and Blue Ridge Physiographic Province for which there are also some specific standards and criteria. The results of the tests of significance are summarized in Table II below.

Table I. Groundwater criteria and individual monitoring well averages.

Parameter	Standard or Criteria	MW-1 (background)	MW-2	MW-3	MW-4
Chloride (mg/L)	25 ⁽³⁾	3.0	38	54	48
Nitrate (mg/L)	5 ⁽²⁾	0.15	0.057	0.097	0.062
Nitrite (mg/L)	0.025 ⁽²⁾	0.012	0.007	0.012	0.012
TKN (mg/L)	No standard/criteria	1.266	2.545	77.7	10.1
Ammonia (mg/L)	0.025 ⁽²⁾	0.012	1.2	66	8
Zinc (mg/L)	0.05 ⁽¹⁾	0.01	0.029	0.023	0.021
Copper (mg/L)	1.0 ⁽¹⁾	0.011	0.010	0.016	0.011
BOD	No standard/criteria	1.35	5.33	7.48	8.05
COD	No standard/criteria	15.68	32.57	72.01	51.54
Sulfate (mg/L)	25 ⁽³⁾	4.0	34	12	6.5
TDS (mg/L)	250 ⁽³⁾	41.4	278	480	379
Sodium (mg/L)	270 ⁽¹⁾ 25 ⁽³⁾	3.8	48	79	65
Conductivity (umhos/cm)	No standard/criteria	83.42	447.4	1042	493.2
pH (SU)	5.5 - 8.5 ⁽³⁾	Min 4.9 Max 9.2	Min 5.7 Max 7.3	Min 5.8 Max 8.4	Min 5.6 Max 7.8

(1) Groundwater standards applicable statewide (9 VAC 25-280-40)

(2) Groundwater standards for the Piedmont & Blue Ridge Physiographic province (9 VAC 25-280-50)

(3) Groundwater criteria for the Piedmont & Blue Ridge Physiographic province (9 VAC 25-280-70)

Table II. Statistical difference between upgradient well (MW-1) and downgradient wells

Monitoring Well	Chloride	Nitrate	Nitrite	TKN	NH4	Zinc	Copper	BOD	COD	Sulfate	TDS	pH	Sodium	Sp. Cond
MW-2	S	NS	NS	S	S	S	NS	S	S	S	S	NS	S	S
MW-3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	S	NS	S
MW-4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	S	S	S

S= significant difference, NS= not significant

Chloride:

Statistical analysis of the chloride data indicated a significant difference in concentration at one of the three downgradient wells. Additionally, the majority of the data collected at the downgradient wells is above the groundwater criteria of 25 mg/L. Linear trends suggest a slight decrease in the

concentrations found at the downgradient MW-2 and MW-3 wells overall. MW-4 exhibits a slight positive trend.

Nitrate:

Downgradient nitrate concentrations were not significantly different from the background well. There are no exceedances of the groundwater standard documented in the groundwater data collected at MW-1, MW-2, MW-3, or MW-4 between March 2005 and February 2013.

Nitrite:

Downgradient nitrite concentrations were not statistically significantly different in the downgradient wells as compared to the upgradient well. There was a single exceedance of the 0.025 mg/L groundwater standard in MW-2 but the remainder of the data collected at all downgradient wells were below the standard.

TKN:

TKN does not have a groundwater standard or criteria. Each of the downgradient wells show elevated concentrations of TKN as compared to MW-1. The average TKN concentration at the upgradient well was 1.26 mg/L while MW-2, MW-3, and MW-4 had average concentrations of 2.54 mg/L, 77.7 mg/L, and 10 mg/L respectively. Overall the regression analysis indicates a weak negative trend in TKN levels at MW-1 and MW-3 and a weak positive trend at MW-2 and MW-4.

Ammonia:

Ammonia concentrations are considerably elevated above the groundwater standard at all of the downgradient wells. MW-2 and MW-3 exhibit a very weak upward trend, while MW-4 has a moderate negative trend.

Zinc:

Zinc concentrations at MW-2 are statistically significantly greater than concentrations found at MW-1, the ambient well. However, the concentrations exhibit a decreasing trend and are below the standard with the exception of one data point. Zinc concentrations at MW-3 and MW-4 are also decreasing and are not significantly different from MW-1. The majority of the datapoints at MW-3 and MW-4 are below the standard.

Copper:

The data indicate no exceedances of the copper groundwater standard at any of the wells. Additionally, the concentrations at the downgradient wells are not significantly greater than those at the upgradient well.

BOD:

BOD does not have a groundwater standard or criterion. The BOD concentration data at the downgradient wells show a weak decreasing trend and with the exception of MW-2, there is no significant difference in the downgradient concentrations.

COD:

COD does not have a groundwater standard or criterion. There is no indication of contamination at MW-3 and MW-4. MW-2 does display a weak increasing trend in the COD concentrations in addition to the data being significantly different from that at MW-1.

Sulfate:

The sulfate criterion for this facility is 25 mg/L. Seventeen of the nineteen datapoints at MW-2 are greater than the criterion, an indication of contamination. Additionally the data at MW-2 is significantly greater than that at MW-1. The difference between sulfate concentrations at the upgradient well and MW-3 and MW-4 is not significant. The majority of datapoints collected at MW-3 and MW-4 are well below the standard. There is a strong positive trend in concentrations at MW-2 and a slight increasing trend at MW-3.

TDS:

TDS concentrations in MW-2 are significantly elevated as compared to MW-1. TDS concentrations at MW-3 and MW-4 are not significantly different from those at MW-1. Most of the downgradient data is in excess of the 250 mg/L standard. The downgradient wells show moderate increasing trends in TDS concentrations, though the same trend is apparent at the upgradient well.

Sodium:

Sodium concentrations at the downgradient wells are all in excess of the criterion of 25 mg/L with the exception of one data point collected at MW-2. However, the concentrations do not exceed the statewide standard of 270 mg/L. Sodium concentrations at the background well are consistently below the criterion. MW-2 and MW-4 exhibit slight positive trends in sodium concentrations over time. MW-2 and MW-4 data is statistically significantly different than that at MW-1.

pH:

Downgradient pH levels show no significant elevations as compared to MW-1. Additionally, there are no excursions from the criterion at the downgradient wells.

Specific Conductance:

There is no groundwater criterion for specific conductance, however the parameter is an indicator of ions in the groundwater and is suggestive of the presence of other pollutants such as chlorides, nitrates, phosphates and sodium. As such, increased specific conductivity values are expected at wells where other parameters have been noted at elevated concentrations. All downgradient wells show significant elevations relative to MW-1. The regression analysis indicates a moderate decreasing trend in the conductance at MW-1, MW-2, and MW-4.

Conclusion:

The greatest level of impact relative to the up-gradient well appears to be at MW-2. MW-2 is located directly east of the former wastewater lagoons so this is to be expected. In general, ammonia, chlorides, BOD/COD, TDS, and sulfate appear to be the parameters of greatest concern. Concentrations of these pollutants are either present at levels greater than the standard/criterion or are found in concentrations in the downgradient wells that are statistically significantly greater than that at the up-gradient well. That being said, increasing trends in pollutant levels at the downgradient wells are weak and nonexistent in many instances. In some cases the pollutant levels are stagnant or may be decreasing slightly. The source of the contamination, the wastewater lagoons, have been closed and reclaimed. As such, it is anticipated that the groundwater contamination will naturally attenuate over time.

Certain parameters are consistently below the groundwater standard/criterion at the down-gradient wells. This is the case for nitrates, nitrites, zinc, and copper. The concentration of these parameters is also not significantly greater at the down-gradient wells (with the exception of zinc at MW-2).

Recommendation:

The lagoon closure plan approved in 1992 relies on removal of the source of contamination, groundwater remediation (pumping and treatment for one year following approval) and long term groundwater monitoring. Natural attenuation of the groundwater is expected over time. The greatest contamination is apparent in MW-2 which is located in closest proximity to the wastewater lagoons. MW-3 and MW-4 located west of the lagoons do not exhibit the same level of groundwater contamination, suggesting that the plume is localized.

Based on this evaluation it appears that contamination is still present for certain parameters but that some of the presently monitored parameters are no longer impacting the groundwater at the site. Since the facility is operating under a monitoring plan that is over 20 years old and may no

longer appropriately target groundwater concerns on the site, staff recommends a revised groundwater monitoring plan be developed. A revised groundwater monitoring plan may be incorporated into the permit via a special condition that requires submission of a revised plan within a certain timeframe following the permit reissuance.

Appendix- Data, Figures, and Tables

1) Groundwater Contour Map

2) Groundwater Monitoring Data Analysis for:

- Chloride
- Nitrate
- Nitrite
- TKN
- Ammonia
- Zinc
- Copper
- BOD₅
- COD
- Sulfate
- TDS
- Sodium
- Specific Conductance
- pH

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Chloride
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	25
Concentration Units (all data):	mg/L

Well Designation ▶	Data Entry					
	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1 3/2/2005	3	38	76	21	43	
2 11/1/2005	3	38	74	35	28	
3 2/28/2006	3	39	69	44	14	
4 4/27/2006	3	34	65	41	12	
5 7/3/2006	3	37	63	46	7	
6 10/13/2006	4	47	71	50	5	
7 2/9/2007	3	40	79	50	36	
8 5/2/2007	2	37	40	55	41	
9 7/26/2007	2	37	59	47	47	
10 10/15/2007	2	38	60	49	50	
11 1/28/2008	2.6	37.2	56.2	51.5	34.8	
12 4/25/2008	3	38.9	54.2	50.2	34.5	
13 8/11/2008	2.6	39.4	0.1	49.9	34.4	
14 1/15/2009	2.9	38.1	54.3	45.7	25.7	
15 4/9/2009	2.9	39.5	58.1	49.6	33.4	
16 9/2/2009	4.62	38.8	57.2	48.9	26.3	
17 10/16/2009	2.8	38.3	55.4	49.9	25.8	
18 1/14/2010	2.4	38.1	56.2	50.5	39.3	
19 7/14/2010	2.4	35.6	5.8	49.2	39.7	
20 8/16/2010	2.4		49	57	24.5	
21 10/28/2010	3.9		55.5	54.5	24.4	
22 3/15/2011	2.7		53.9	49.4	38.8	
23 6/21/2011	2.8		3.3	1.9	37.2	
24 9/19/2011	2.3		56.4	52.2	30.3	
25 12/13/2011	5.2		60.3	56.1	37.7	
26 2/22/2012	2.4		60.7	58.1		
27 9/12/2012	2.2		60.4	53.9		
28 12/6/2012	2.1		59.8	54.2		
29 2/19/2013	7.1		66.8	61.5		
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Normal	Not normal	Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	0.000258756	0.204365873	Slight Increase	Very Weak
MW2	Compliance Well #1	-0.00033963	-0.076523718	Slight Decrease	Very Weak
MW3	Compliance Well #2	-0.006313803	-0.277206233	Slight Decrease	Moderately Weak
MW4	Compliance Well #3	0.004418996	0.327060649	Slight Increase	Moderately Weak
CB	Compliance Well #4	0.003978796	0.250589568	Slight Increase	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well			0	0%	29
MW2	Compliance Well #1			19	100%	19
MW3	Compliance Well #2			26	89.7%	29
MW4	Compliance Well #3			27	93.1%	29
CB	Compliance Well #4			19	76%	25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	7.100	2.000	3.011		
MW2	Compliance Well #1	47.000	34.000	38.363		
MW3	Compliance Well #2	79.000	0.100	54.469		
MW4	Compliance Well #3	61.500	1.900	47.662		
CB	Compliance Well #4	50.000	5.000	30.792		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Nitrate
Applicable GW Standard (if none leave blank):	5
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Well Designation ▶	Data Entry					
	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	0.21	0.19	0.01	0.01	1.5
2	11/1/2005	0.14	0.01	0.01	0.01	6.44
3	2/28/2006	0.01	0.01	0.01	0.01	0.01
4	4/27/2006	0.13	0.08	0.01	0.01	4.54
5	7/3/2006	0.13	0.01	0.05	0.01	2.32
6	10/13/2006	0.14	0.01	0.05	0.05	0.59
7	2/9/2007	0.14	0.03	0.03	0.04	2.96
8	5/2/2007	0.18	0.16	0.06	0.06	3.5
9	7/26/2007	0.13	0.01	0.06	0.04	2.55
10	10/15/2007	0.11	0.01	0.08	0.05	1.88
11	1/28/2008	0.21	0.02	0.02	0.04	5.62
12	4/25/2008	0.19	0.22	0.04	0.07	1.31
13	8/11/2008	0.13	0.02	0.01	0.09	1.81
14	1/15/2009	0.13	0.02	0.06	0.03	3.71
15	4/9/2009	0.58	0.06	0.01	0.04	5.02
16	9/2/2009	0.05	0.02	0.08	0.03	6.18
17	10/16/2009	0.14	0.02	0.53	0.27	10.5
18	1/14/2010	0.13	0.04	0.03	0.04	2.89
19	7/14/2010	0.21	0.14	0.02	0.05	3.32
20	8/16/2010	0.11		0.05	0.06	6.42
21	10/28/2010	0.09		0.05	0.14	3.3
22	3/15/2011	0.12		0.01	0.01	2.37
23	6/21/2011	0.2		0.04	0.03	3.06
24	9/19/2011	0.11		0.07	0.03	3.9
25	12/13/2011	0.12		0.32	0.19	3.28
26	2/22/2012	0.12		0.1	0.1	
27	9/12/2012	0.2		0.1	0.1	
28	12/6/2012	0.1		0.2	0.1	
29	2/19/2013	0.1		0.7	0.1	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Not Significant	Not Significant
CB	Compliance Well #4	Normal	Not normal	Not Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-3.93487E-06	-0.035569169	Slight Decrease	Very Weak
MW2	Compliance Well #1	-4.72733E-06	-0.039492032	Slight Decrease	Very Weak
MW3	Compliance Well #2	8.60636E-05	0.464508052	Slight Increase	Moderately Weak
MW4	Compliance Well #3	3.19044E-05	0.468124407	Slight Increase	Moderately Weak
CB	Compliance Well #4	0.000781627	0.256960528	Slight Increase	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well	0	0%			29
MW2	Compliance Well #1	0	0%			19
MW3	Compliance Well #2	0	0%			29
MW4	Compliance Well #3	0	0%			29
CB	Compliance Well #4	6	24%			25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	0.580	0.010	0.150		
MW2	Compliance Well #1	0.220	0.010	0.057		
MW3	Compliance Well #2	0.700	0.010	0.097		
MW4	Compliance Well #3	0.270	0.010	0.062		
CB	Compliance Well #4	10.500	0.010	3.559		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Nitrite
Applicable GW Standard (if none leave blank):	0.025
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Well Designation ▶	Data Entry					
	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	0.005	0.005	0.005	0.005	0.005
2	11/1/2005	0.005	0.005	0.005	0.005	0.005
3	2/28/2006	0.005	0.005	0.005	0.005	0.005
4	4/27/2006	0.005	0.005	0.005	0.005	0.005
5	7/3/2006	0.005	0.005	0.005	0.005	0.05
6	10/13/2006	0.005	0.005	0.005	0.005	0.005
7	2/9/2007	0.005	0.005	0.005	0.005	0.005
8	5/2/2007	0.005	0.005	0.005	0.005	0.07
9	7/26/2007	0.005	0.005	0.005	0.005	0.005
10	10/15/2007	0.005	0.005	0.005	0.005	0.005
11	1/28/2008	0.005	0.005	0.005	0.005	0.005
12	4/25/2008	0.005	0.005	0.005	0.005	0.008
13	8/11/2008	0.005	0.005	0.005	0.005	0.37
14	1/15/2009	0.005	0.005	0.005	0.005	0.005
15	4/9/2009	0.019	0.008	0.007	0.005	0.005
16	9/2/2009	0.01	0.043	0.007	0.011	0.005
17	10/16/2009	0.005	0.005	0.005	0.005	0.005
18	1/14/2010	0.005	0.005	0.005	0.005	0.005
19	7/14/2010	0.006	0.009	0.005	0.01	0.005
20	8/16/2010	0.005		0.005	0.005	0.005
21	10/28/2010	0.01		0.01	0.01	0.01
22	3/15/2011	0.01		0.01	0.01	
23	6/21/2011	0.005		0.025	0.005	0.005
24	9/19/2011	0.005		0.005	0.005	0.005
25	12/13/2011	0.005		0.005	0.005	0.005
26	2/22/2012	0.05		0.05	0.05	
27	9/12/2012	0.05		0.05	0.05	
28	12/6/2012	0.05		0.05	0.05	
29	2/19/2013	0.05		0.05	0.05	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Not Significant	Not Significant
CB	Compliance Well #4	Not normal	Not normal	Not Significant	Not Significant	Not Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	1.145E-05	0.627337558	Slight Increase	Moderately Strong
MW2	Compliance Well #1	5.16967E-06	0.337917565	Slight Increase	Moderately Weak
MW3	Compliance Well #2	1.21878E-05	0.661632255	Slight Increase	Moderately Strong
MW4	Compliance Well #3	1.15453E-05	0.6341101	Slight Increase	Moderately Strong
CB	Compliance Well #4	-5.64644E-06	-0.056590479	Slight Decrease	Very Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well	4	13.8%			29
MW2	Compliance Well #1	1	5.3%			19
MW3	Compliance Well #2	5	17.2%			29
MW4	Compliance Well #3	4	13.8%			29
CB	Compliance Well #4	3	12%			25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	0.050	0.005	0.012		
MW2	Compliance Well #1	0.043	0.005	0.007		
MW3	Compliance Well #2	0.050	0.005	0.012		
MW4	Compliance Well #3	0.050	0.005	0.012		
CB	Compliance Well #4	0.370	0.005	0.025		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Total Kjeldahl Nitrogen
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Data Entry						
Well Designation ▶	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	0.5	1.7	126	8.5	35.5
2	11/1/2005	0.5	1.85	97.2	4.98	5.07
3	2/28/2006	0.5	1.51	77.3	3.75	0.5
4	4/27/2006	0.5	1.4	83.2	3.75	0.5
5	7/3/2006	0.5	1.55	114	3.19	0.55
6	10/13/2006	0.5	1.54	82.7	3.04	3.98
7	2/9/2007	0.5	1.21	62.9	2.84	10.8
8	5/2/2007	0.5	1.34	2.48	81.6	8.55
9	7/26/2007	0.5	1.56	82	2.51	17.8
10	10/15/2007	0.5	1.69	90.1	2.6	22.7
11	1/28/2008	0.5	2.6	86.1	3.7	4
12	4/25/2008	15	5.2	78.4	25.3	3.1
13	8/11/2008	2.6	2.3	0.5	4.4	6.2
14	1/15/2009	2.24	6.72	121.8	6.72	4.76
15	4/9/2009	5.38	9.68	81.1	6.18	0.5
16	9/2/2009	0.12	2.1	71.5	1.63	0.5
17	10/16/2009	0.5	1.9	102.7	1.76	0.5
18	1/14/2010	0.5	1.6	70.6	1.2	3.9
19	7/14/2010	0.5	0.9	71.8	1	3.1
20	8/16/2010	0.5		1.36	26	0.4
21	10/28/2010	0.42		114.1	1.88	0.74
22	3/15/2011	0.2		71.6	1.6	3.7
23	6/21/2011	0.2		58.6	1.62	3.76
24	9/19/2011	2.06		92.44	2.84	1.24
25	12/13/2011	0.2		81.2	0.3	3.3
26	2/22/2012	0.2		83.5	1.18	
27	9/12/2012	0.2		85.5	1.33	
28	12/6/2012	0.2		84.3	85.6	
29	2/19/2013	0.2		80	1.13	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Not normal	Not normal	Not Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-0.000321322	-0.096571571	Slight Decrease	Very Weak
MW2	Compliance Well #1	0.001202176	0.305435377	Slight Increase	Moderately Weak
MW3	Compliance Well #2	-0.003409417	-0.094450221	Slight Decrease	Very Weak
MW4	Compliance Well #3	0.001560642	0.06287564	Slight Increase	Very Weak
CB	Compliance Well #4	-0.00492511	-0.440949808	Slight Decrease	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well					29
MW2	Compliance Well #1					19
MW3	Compliance Well #2					29
MW4	Compliance Well #3					29
CB	Compliance Well #4					25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	15.000	0.120	1.266		
MW2	Compliance Well #1	9.680	0.900	2.545		
MW3	Compliance Well #2	126.000	0.500	77.758		
MW4	Compliance Well #3	85.600	0.300	10.073		
CB	Compliance Well #4	35.500	0.400	5.826		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Ammonia
Applicable GW Standard (if none leave blank):	0.025
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Data Entry						
Well Designation ▶	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	0.08	0.07	1.64	74.4	5.86
2	11/1/2005	0.05	1.46	91.2	4.87	4.42
3	2/28/2006	0.005	1.18	80.2	3.28	0.005
4	4/27/2006	0.005	1.15	85.8	2.86	0.06
5	7/3/2006	0.005	1.34	82.6	2.8	0.09
6	10/13/2006	0.005	1.43	80.4	2.27	0.005
7	2/9/2007	0.005	1.27	78.7	1.52	9.99
8	5/2/2007	0.005	1.25	1.74	85	6.94
9	7/26/2007	0.005	1.2	92.2	1.88	15.9
10	10/15/2007	0.005	1.46	98.1	1.74	17.8
11	1/28/2008	0.01	1.54	74.64	2.04	2.53
12	4/25/2008	0.02	1.09	68.69	1.93	1.82
13	8/11/2008	0.02	1.43	0.01	1.71	2.82
14	1/15/2009	0.02	1.45	78.75	1.73	0.01
15	4/9/2009	0.01	1.17	65.8	1.22	0.27
16	9/2/2009	0.01	1.6	63	1.5	0.05
17	10/16/2009	0.005	0.74	81.2	1.42	0.03
18	1/14/2010	0.01	1.1	64.8	1.08	3.69
19	7/14/2010	0.005	0.77	60.3	0.92	2.74
20	8/16/2010	0.02		1.09	19.7	0.06
21	10/28/2010	0.01		66.3	0.82	0.02
22	3/15/2011	0.005		67.2	1.29	3.2
23	6/21/2011	0.005		54.7	1.1	3.37
24	9/19/2011	0.01		51.3	0.75	0.17
25	12/13/2011	0.005		66.49	0.1	2.47
26	2/22/2012	0.005		82.1	0.78	
27	9/12/2012	0.005		93.6	1.15	
28	12/6/2012	0.005		85.6	0.92	
29	2/19/2013	0.005		89.3	0.75	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Not normal	Normal	Not Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-7.95786E-06	-0.425929335	Slight Decrease	Moderately Weak
MW2	Compliance Well #1	6.35036E-05	0.100920265	Slight Increase	Very Weak
MW3	Compliance Well #2	0.003238474	0.096339831	Slight Increase	Very Weak
MW4	Compliance Well #3	-0.00854358	-0.360525665	Slight Decrease	Moderately Weak
CB	Compliance Well #4	-0.001688063	-0.259241405	Slight Decrease	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well	2	6.9%			29
MW2	Compliance Well #1	19	100%			19
MW3	Compliance Well #2	28	96.6%			29
MW4	Compliance Well #3	29	100%			29
CB	Compliance Well #4	21	84%			25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	0.080	0.005	0.012		
MW2	Compliance Well #1	1.600	0.070	1.195		
MW3	Compliance Well #2	98.100	0.010	65.774		
MW4	Compliance Well #3	85.000	0.100	7.639		
CB	Compliance Well #4	17.800	0.005	3.373		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Zinc
Applicable GW Standard (if none leave blank):	0.05
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Well Designation ▶	Data Entry					
	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	0.01	0.28	0.23	0.14	0.08
2	11/1/2005	0.01	0.01	0.01	0.01	0.21
3	2/28/2006	0.01	0.04	0.01	0.02	0.02
4	4/27/2006	0.01	0.01	0.01	0.02	0.02
5	7/3/2006	0.01	0.01	0.02	0.04	0.02
6	10/13/2006	0.01	0.03	0.01	0.01	0.02
7	2/9/2007	0.01	0.01	0.01	0.01	0.039
8	5/2/2007	0.01	0.01	0.01	0.01	0.019
9	7/26/2007	0.02	0.02	0.02	0.022	0.033
10	10/15/2007	0.01	0.01	0.02	0.01	0.01
11	1/28/2008	0.01	0.01	0.012	0.015	0.034
12	4/25/2008	0.01	0.02	0.024	0.03	0.03
13	8/11/2008	0.01	0.017	0.01	0.026	0.056
14	1/15/2009	0.01	0.015	0.01	0.01	0.01
15	4/9/2009	0.01	0.01	0.019	0.024	0.029
16	9/2/2009	0.01	0.012	0.02	0.025	0.05
17	10/16/2009	0.01	0.01	0.01	0.01	0.037
18	1/14/2010	0.01	0.01	0.01	0.011	0.014
19	7/14/2010	0.01	0.01	0.01	0.01	0.01
20	8/16/2010	0.01		0.01	0.01	0.01
21	10/28/2010	0.01		0.05	0.05	0.05
22	3/15/2011	0.01		0.01	0.01	0.01
23	6/21/2011	0.01		0.01	0.01	0.01
24	9/19/2011	0.01		0.01	0.01	0.01
25	12/13/2011	0.01		0.01	0.01	0.01
26	2/22/2012	0.01		0.01	0.0128	
27	9/12/2012	0.01		0.01	0.0167	
28	12/6/2012	0.01		0.05	0.015	
29	2/19/2013	0.01		0.01	0.0172	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Not Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Not normal	Not normal	Not Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-3.01324E-07	-0.139070817	Slight Decrease	Very Weak
MW2	Compliance Well #1	-4.98084E-05	-0.461240933	Slight Decrease	Moderately Weak
MW3	Compliance Well #2	-1.35405E-05	-0.281201858	Slight Decrease	Moderately Weak
MW4	Compliance Well #3	-1.03782E-05	-0.357411157	Slight Decrease	Moderately Weak
CB	Compliance Well #4	-2.39711E-05	-0.432164207	Slight Decrease	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well	0	0%			29
MW2	Compliance Well #1	1	5.3%			19
MW3	Compliance Well #2	3	10.3%			29
MW4	Compliance Well #3	2	6.9%			29
CB	Compliance Well #4	5	20%			25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	0.020	0.010	0.010		
MW2	Compliance Well #1	0.280	0.010	0.029		
MW3	Compliance Well #2	0.230	0.010	0.023		
MW4	Compliance Well #3	0.140	0.010	0.021		
CB	Compliance Well #4	0.210	0.010	0.034		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Copper
Applicable GW Standard (if none leave blank):	1.0
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Data Entry						
Well Designation ▶	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	0.01	0.01	0.01	0.01	0.01
2	11/1/2005	0.01	0.01	0.01	0.01	0.01
3	2/28/2006	0.01	0.01	0.01	0.01	0.01
4	4/27/2006	0.01	0.01	0.01	0.01	0.01
5	7/3/2006	0.01	0.01	0.01	0.01	0.01
6	10/13/2006	0.01	0.01	0.01	0.01	0.01
7	2/9/2007	0.001	0.0024	0.002	0.002	0.0024
8	5/2/2007	0.01	0.01	0.01	0.01	0.01
9	7/26/2007	0.01	0.01	0.01	0.01	0.01
10	10/15/2007	0.01	0.01	0.01	0.01	0.01
11	1/28/2008	0.01	0.01	0.01	0.01	0.01
12	4/25/2008	0.01	0.01	0.039	0.01	0.01
13	8/11/2008	0.01	0.01	0.02	0.01	0.01
14	1/15/2009	0.01	0.01	0.01	0.01	0.01
15	4/9/2009	0.01	0.01	0.01	0.01	0.01
16	9/2/2009	0.01	0.01	0.064	0.01	0.01
17	10/16/2009	0.01	0.01	0.052	0.01	0.01
18	1/14/2010	0.01	0.01	0.01	0.01	0.01
19	7/14/2010	0.01	0.01	0.01	0.01	0.01
20	8/16/2010	0.01		0.01	0.01	0.01
21	10/28/2010	0.02		0.02	0.02	0.02
22	3/15/2011	0.02		0.02	0.02	0.02
23	6/21/2011	0.02		0.02	0.02	0.02
24	9/19/2011	0.02		0.02	0.02	0.02
25	12/13/2011	0.02		0.02	0.02	0.02
26	2/22/2012	0.01		0.01	0.01	
27	9/12/2012	0.01		0.01	0.01	
28	12/6/2012	0.01		0.01	0.01	
29	2/19/2013	0.01		0.01	0.01	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Not Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Not Significant	Not Significant
CB	Compliance Well #4	Not normal	Not normal	Not Significant	Not Significant	Not Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	2.27087E-06	0.450307742	Slight Increase	Moderately Weak
MW2	Compliance Well #1	3.7278E-07	0.121585865	Slight Increase	Very Weak
MW3	Compliance Well #2	2.41618E-06	0.153365138	Slight Increase	Very Weak
MW4	Compliance Well #3	2.23262E-06	0.451375778	Slight Increase	Moderately Weak
CB	Compliance Well #4	4.14964E-06	0.68032008	Slight Increase	Moderately Strong
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well	0	0%			29
MW2	Compliance Well #1	0	0%			19
MW3	Compliance Well #2	0	0%			29
MW4	Compliance Well #3	0	0%			29
CB	Compliance Well #4	0	0%			25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	0.020	0.001	0.011		
MW2	Compliance Well #1	0.010	0.002	0.010		
MW3	Compliance Well #2	0.064	0.002	0.016		
MW4	Compliance Well #3	0.020	0.002	0.011		
CB	Compliance Well #4	0.020	0.002	0.012		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	BOD5
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Well Designation ▶	Data Entry					
	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	2	4	8	11	1
2	11/1/2005	1	3	5	8	20
3	2/28/2006	3	5	6	12	5
4	4/27/2006	1	5	6	9	1
5	7/3/2006	1	8	6	14	1
6	10/13/2006	1	8	11	15	5
7	2/9/2007	1	1	9	6	1
8	5/2/2007	1	1	10	11	1
9	7/26/2007	1	5	6	14	1
10	10/15/2007	1	5	15	9	1
11	1/28/2008	1	3.2	10.2	5.9	4
12	4/25/2008	1	1	9.7	8.3	1
13	8/11/2008	1	4.1	3	10.8	12.3
14	1/15/2009	3.9	9.5	11	14.3	1
15	4/9/2009	1	1	8.7	4.8	1
16	9/2/2009	5.3	14.7	11	12.8	1
17	10/16/2009	1	5.5	11.1	12.7	1
18	1/14/2010	1	5.6	10.2	7.3	1
19	7/14/2010	1	11.6	1	6.5	1
20	8/16/2010	1		7	4.4	1
21	10/28/2010	1		9.6	7.5	5
22	3/15/2011	1		5.2	1	1
23	6/21/2011	1		8.2	11.9	1
24	9/19/2011	1		6.4	7	1
25	12/13/2011	1		11	1	1
26	2/22/2012	1		4.4	2.8	
27	9/12/2012	1		1	2.2	
28	12/6/2012	1		1	1	
29	2/19/2013	1		5.3	2.2	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Not normal	Not normal	Not Significant	Not Significant	Not Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-0.000163049	-0.138967337	Slight Decrease	Very Weak
MW2	Compliance Well #1	0.002424278	0.371763011	Slight Increase	Moderately Weak
MW3	Compliance Well #2	-0.00122079	-0.3019601	Slight Decrease	Moderately Weak
MW4	Compliance Well #3	-0.003351111	-0.652900022	Slight Decrease	Moderately Strong
CB	Compliance Well #4	-0.001873699	-0.314470133	Slight Decrease	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well					29
MW2	Compliance Well #1					19
MW3	Compliance Well #2					29
MW4	Compliance Well #3					29
CB	Compliance Well #4					25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	5.300	1.000	1.352		
MW2	Compliance Well #1	14.700	1.000	5.326		
MW3	Compliance Well #2	15.000	1.000	7.483		
MW4	Compliance Well #3	15.000	1.000	8.048		
CB	Compliance Well #4	20.000	1.000	2.812		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	COD
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

Well Designation ▶	Data Entry					
	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	35	67	74	104	41
2	11/1/2005	2	2	52	52	24
3	2/28/2006	28	56	69	84	23
4	4/27/2006	2	2	62	37	2
5	7/3/2006	37	16	142	65	23
6	10/13/2006	2	15	71	45	26
7	2/9/2007	2	2	59	35	17
8	5/2/2007	2	21	51	72	21
9	7/26/2007	2	2	37	27	2
10	10/15/2007	2	31	75	43	33
11	1/28/2008	15.7	43.1	82.3	66.6	23.5
12	4/25/2008	51	62	92	76	28
13	8/11/2008	20.2	44.4	2	56.7	30.3
14	1/15/2009	30	50	92	50	24
15	4/9/2009	9.3	18.5	74.1	38.9	9.3
16	9/2/2009	33.3	62.7	101.9	70.6	13.7
17	10/16/2009	28.3	22.7	94.4	37.8	7.6
18	1/14/2010	7.6	51.4	87.6	57.2	22.9
19	7/14/2010	12.5	50	64.3	85.7	21.4
20	8/16/2010	14.8		48.1	66.7	22.2
21	10/28/2010	9.5		89.7	43.1	25.9
22	3/15/2011	11.8		92.1	64.7	17.6
23	6/21/2011	7.3		94.6	40	25.5
24	9/19/2011	11.1		100	48.2	25.9
25	12/13/2011	<4.0		84.9	24.5	18.9
26	2/22/2012	<10		44.3	35	
27	9/12/2012	<10		50.7	23	
28	12/6/2012	<10		50.9	20.4	
29	2/19/2013	<10		50.4	25.5	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Not normal	Not normal	Not Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-0.003992219	-0.255337308	Slight Decrease	Moderately Weak
MW2	Compliance Well #1	0.012829542	0.318008271	Slight Increase	Moderately Weak
MW3	Compliance Well #2	-0.001039127	-0.033618387	Slight Decrease	Very Weak
MW4	Compliance Well #3	-0.011985686	-0.48696993	Slight Decrease	Moderately Weak
CB	Compliance Well #4	-0.001138088	-0.093534342	Slight Decrease	Very Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well					29
MW2	Compliance Well #1					19
MW3	Compliance Well #2					29
MW4	Compliance Well #3					29
CB	Compliance Well #4					25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	51.000	2.000	15.683		
MW2	Compliance Well #1	67.000	2.000	32.568		
MW3	Compliance Well #2	142.000	2.000	72.010		
MW4	Compliance Well #3	104.000	20.400	51.538		
CB	Compliance Well #4	41.000	2.000	21.148		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Sulfate
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	25
Concentration Units (all data):	mg/L

Data Entry						
Well Designation ▶	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	1	29.8	9.9	1	12.4
2	11/1/2005	1	27.1	17	1	15.9
3	2/28/2006	5.5	23.6	17.8	4.64	15.8
4	4/27/2006	3.21	24	21.1	5.3	20
5	7/3/2006	11.4	30.2	23.9	6.59	29.9
6	10/13/2006	6.36	27.1	19.3	1	14.2
7	2/9/2007	4.9	29.7	24.2	3.29	14.9
8	5/2/2007	4.15	32.8	3.55	21.1	15
9	7/26/2007	4.54	29.5	17.9	4.43	6.05
10	10/15/2007	1	31	12	2.6	3.3
11	1/28/2008	3.6	36.1	1	1	9.6
12	4/25/2008	5.4	32.8	5.8	4.6	23.8
13	8/11/2008	4.4	34.9	2	1	25
14	1/15/2009	3.5	40.1	7.1	10.4	14.1
15	4/9/2009	1	41.3	1	1	11.8
16	9/2/2009	1	42.6	2.4	3.6	1
17	10/16/2009	3.8	39	4.2	13.4	2.9
18	1/14/2010	3.1	50	2.9	6.5	18.9
19	7/14/2010	4.7	49.7	1	7	17.6
20	8/16/2010	1		4.6	2.5	13.6
21	10/28/2010	18.2		2.9	3.5	16.6
22	3/15/2011	6.2		2.9	2.2	18.1
23	6/21/2011	7		8.5	4.5	20.4
24	9/19/2011	2.5		6.4	2.4	14
25	12/13/2011	3.3		13.9	3.7	18.4
26	2/22/2012	1		28.3	2.9	
27	9/12/2012	1.4		12.7	2.6	
28	12/6/2012	1		11.3	2.5	
29	2/19/2013	1		66.8	61.5	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Not Significant	Not Significant
CB	Compliance Well #4	Normal	Not normal	Not Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-0.000421143	-0.09873543	Slight Decrease	Very Weak
MW2	Compliance Well #1	0.012318661	0.903648051	Slight Increase	Very Strong
MW3	Compliance Well #2	0.00131346	0.085148945	Slight Increase	Very Weak
MW4	Compliance Well #3	0.003558339	0.267261533	Slight Increase	Moderately Weak
CB	Compliance Well #4	-0.000165419	-0.017937294	Slight Decrease	Very Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well			0	0%	29
MW2	Compliance Well #1			17	89.5%	19
MW3	Compliance Well #2			2	6.9%	29
MW4	Compliance Well #3			1	3.4%	29
CB	Compliance Well #4			2	8%	25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	18.200	1.000	4.006		
MW2	Compliance Well #1	50.000	23.600	34.279		
MW3	Compliance Well #2	66.800	1.000	12.150		
MW4	Compliance Well #3	61.500	1.000	6.474		
CB	Compliance Well #4	29.900	1.000	14.930		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Total Dissolved Solids
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	250
Concentration Units (all data):	mg/L

Data Entry						
Well Designation ▶	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	10	260	410	104	326
2	11/1/2005	60	268	478	278	304
3	2/28/2006	20	244	496	312	112
4	4/27/2006	42	246	520	350	124
5	7/3/2006	10	228	504	324	90
6	10/13/2006	58	292	592	454	118
7	2/9/2007	36	268	478	318	252
8	5/2/2007	36	254	274	530	230
9	7/26/2007	64	312	552	326	466
10	10/15/2007	10	202	460	348	472
11	1/28/2008	34	284	552	378	360
12	4/25/2008	18	296	536	398	206
13	8/11/2008	26	318	10	424	268
14	1/15/2009	40	314	520	372	214
15	4/9/2009	44	304	504	340	152
16	9/2/2009	56	308	504	378	232
17	10/16/2009	74	382	546	442	258
18	1/14/2010	10	190	370	255	132
19	7/14/2010	52	310	635	460	260
20	8/16/2010	35		488	586	212
21	10/28/2010	32		454	336	256
22	3/15/2011	66		534	362	214
23	6/21/2011	70		502	406	272
24	9/19/2011	54		564	464	206
25	12/13/2011	66		466	366	282
26	2/22/2012	38		521	396	
27	9/12/2012	32		453	456	
28	12/6/2012	47		485	404	
29	2/19/2013	61		513	413	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Not normal	Not normal	Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	0.00883366	0.387992571	Slight Increase	Moderately Weak
MW2	Compliance Well #1	0.032133468	0.401299236	Slight Increase	Moderately Weak
MW3	Compliance Well #2	0.015454115	0.11758325	Slight Increase	Very Weak
MW4	Compliance Well #3	0.047128543	0.454574019	Slight Increase	Moderately Weak
CB	Compliance Well #4	0.000608502	0.004618194	Slight Increase	Very Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well			0	0%	29
MW2	Compliance Well #1			14	73.7%	19
MW3	Compliance Well #2			28	96.6%	29
MW4	Compliance Well #3			28	96.6%	29
CB	Compliance Well #4			12	48%	25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	74.000	10.000	41.414		
MW2	Compliance Well #1	382.000	190.000	277.895		
MW3	Compliance Well #2	635.000	10.000	480.034		
MW4	Compliance Well #3	586.000	104.000	378.621		
CB	Compliance Well #4	472.000	90.000	240.720		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Sodium
Applicable GW Standard (if none leave blank):	270
Applicable GW Criteria (if none leave blank):	25
Concentration Units (all data):	mg/L

Data Entry						
Well Designation ▶	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	3/2/2005	6.8	43.3	74.9	35.8	32.5
2	11/1/2005	3.3	40	103	41.3	28.8
3	2/28/2006	4.2	41.1	67.4	45.3	15
4	4/27/2006	4.4	40.2	72.6	46.7	15.4
5	7/3/2006	4.1	41.2	72	48.9	13.9
6	10/13/2006	3.7	42	71.5	52.8	9.9
7	2/9/2007	4.1	43	70	53	34
8	5/2/2007	5.1	44	55	71	1
9	7/26/2007	4	45	77	55	49
10	10/15/2007	3.4	44	67	57	60
11	1/28/2008	3.26	67.5	117	64.2	49.1
12	4/25/2008	7.06	52	329	70	41
13	8/11/2008	3.21	48	1	62	52
14	1/15/2009	3.49	53	77.1	69.6	37.1
15	4/9/2009	3.64	63.3	70.9	66.1	28.1
16	9/2/2009	2.96	46	63.5	65.5	9.04
17	10/16/2009	2.63	50.9	69.3	71.6	10.1
18	1/14/2010	3.52	51.7	75.7	74.6	46.8
19	7/14/2010	3.51	51.2	67.9	65.9	44.8
20	8/16/2010	2.64		77	77.1	36.6
21	10/28/2010	2.73		64.9	71.8	35.7
22	3/15/2011	3.18		80.7	79.7	52.7
23	6/21/2011	3.13		63.4	67.1	78.7
24	9/19/2011	2.26		51.1	57.7	30.5
25	12/13/2011	5.17		85.5	89.4	66.4
26	2/22/2012	4.8		72	79.1	
27	9/12/2012	3.35		68	78.5	
28	12/6/2012	3.24		64.2	80.7	
29	2/19/2013	3.85		64.5	80	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Not normal	Not normal	Not Significant	Significant	Significant
MW4	Compliance Well #3	Normal	Normal	Not Significant	Significant	Significant
CB	Compliance Well #4	Normal	Not normal	Not Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-0.000482325	-0.372094358	Slight Decrease	Moderately Weak
MW2	Compliance Well #1	0.00800395	0.600737855	Slight Increase	Moderately Strong
MW3	Compliance Well #2	-0.007460344	-0.124277862	Slight Decrease	Very Weak
MW4	Compliance Well #3	0.013381962	0.858642423	Slight Increase	Very Strong
CB	Compliance Well #4	0.012633522	0.475486094	Slight Increase	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well	0	0%	0	0%	29
MW2	Compliance Well #1	0	0%	19	100%	19
MW3	Compliance Well #2	1	3.4%	28	96.6%	29
MW4	Compliance Well #3	0	0%	29	100%	29
CB	Compliance Well #4	0	0%	18	72%	25
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	7.060	2.260	3.818		
MW2	Compliance Well #1	67.500	40.000	47.758		
MW3	Compliance Well #2	329.000	1.000	79.072		
MW4	Compliance Well #3	89.400	35.800	64.738		
CB	Compliance Well #4	78.700	1.000	35.126		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	Specific Conductance
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	umhos/cm

Data Entry						
Well Designation ►	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	1/28/2008	74	464	1412	598	5960
2	4/25/2008	43	458	1294	614	400
3	8/11/2008	40	448	0.2	604	384
4	1/15/2009	351	490	1322	578	479
5	4/9/2009	184	440	1173	575	291
6	9/2/2009	175	440	1181	611	216
7	10/16/2009	335	442	1198	601	210
8	1/14/2010	39	429	1036	545	329
9	7/14/2010	46	416	1118	502	382
10	8/16/2010	25		726	450	280
11	10/28/2010	14		756	361	238
12	3/15/2011	30		703	340	242
13	6/21/2011	16		692	324	259
14	9/19/2011	25		674	350	212
15	12/13/2011	42		705	322	316
16	2/22/2012	35		1583	8	
17	9/12/2012	39		1443	643	
18	12/6/2012	32		1450	723	
19	2/19/2013	40		1340	622	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #2	Normal	Not normal	Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Significant	Significant	Significant
CB	Compliance Well #4	Not normal	Not normal	Significant	Not Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-0.076126278	-0.425332799	Slight Decrease	Moderately Weak
MW2	Compliance Well #1	-0.050142004	-0.705659451	Slight Decrease	Moderately Strong
MW3	Compliance Well #2	0.100568501	0.146165902	Slight Increase	Very Weak
MW4	Compliance Well #3	-0.089946388	-0.301307205	Slight Decrease	Moderately Weak
CB	Compliance Well #4	-1.51468788	-0.470706582	Strong Decrease	Moderately Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well					19
MW2	Compliance Well #1					9
MW3	Compliance Well #2					19
MW4	Compliance Well #3					19
CB	Compliance Well #4					15
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	351.000	14.000	83.421		
MW2	Compliance Well #1	490.000	416.000	447.444		
MW3	Compliance Well #2	1583.000	0.200	1042.432		
MW4	Compliance Well #3	723.000	8.000	493.211		
CB	Compliance Well #4	5960.000	210.000	679.867		
	Compliance Well #5					

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Tyson Foods - Glen Allen
Permit No.:	VA0004031
Monitoring Parameter:	pH
Applicable GW Criteria (Lower):	5.5
Applicable GW Criteria (Higher):	8.5
Concentration Units (all data):	S.U.

Data Entry						
Well Designation ►	MW1	MW2	MW3	MW4	CB	
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	1/28/2008	4.96	5.77	6.24	5.67	5.77
2	4/25/2008	5.01	5.66	6.36	5.61	5.46
3	8/11/2008	6.64	6.9		6.78	6.72
4	1/15/2009	6.08	5.92	6.19	5.96	7.05
5	4/9/2009	6.34	6.49	6.68	6.8	6.96
6	9/2/2009	7.14	7.32	7.12	6.8	7.21
7	10/16/2009	5.6	6.33	5.81	6.03	6.78
8	1/14/2010	9.21	6.26	8.37	7.3	7.82
9	7/14/2010	6.23	6.34	6.93	6.26	6.72
10	8/16/2010	5.6		6.58	5.95	7.24
11	10/28/2010	5.38		6.56	6.17	7.32
12	3/15/2011	5.78		6.59	6.21	5.88
13	6/21/2011	5.74		6.65	6.01	6.22
14	9/19/2011	5.63		6.41	5.91	6.35
15	12/13/2011	5.75		6.58	6.01	6.39
16	2/22/2012	6.02		6.43	6.6	
17	9/12/2012	4.93		6.61	5.98	
18	12/6/2012	5.06		6.02	7.76	
19	2/19/2013	5.58		5.95	6.69	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW1	Background Well	Not normal	Not normal		N/A	
MW2	Compliance Well #1	Normal	Normal	Not Significant	Not Significant	Not Significant
MW3	Compliance Well #2	Not normal	Not normal	Significant	Significant	Significant
MW4	Compliance Well #3	Not normal	Not normal	Significant	Not Significant	Significant
CB	Compliance Well #4	Not normal	Not normal	Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW1	Background Well	-0.000381942	-0.223091449	Slight Decrease	Very Weak
MW2	Compliance Well #1	0.00069582	0.393871696	Slight Increase	Moderately Weak
MW3	Compliance Well #2	-0.000151421	-0.152225712	Slight Decrease	Very Weak
MW4	Compliance Well #3	0.000262375	0.267543325	Slight Increase	Moderately Weak
CB	Compliance Well #4	0.000150565	0.105555715	Slight Increase	Very Weak
	Compliance Well #5				

Results: Groundwater Standards/Criteria Comparison

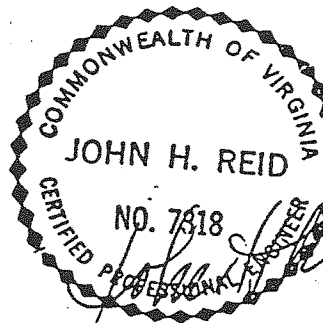
		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW1	Background Well	14	73.7%	1	5.3%	19
MW2	Compliance Well #1	9	100%	0	0%	9
MW3	Compliance Well #2	18	100%	0	0%	18
MW4	Compliance Well #3	19	100%	0	0%	19
CB	Compliance Well #4	14	93.3%	0	0%	15
	Compliance Well #5					

Results: Basic Statistics (less-than values ignored)

		Maximum Value	Minimum Value	Average		
MW1	Background Well	9.210	4.930	5.931		
MW2	Compliance Well #1	7.320	5.660	6.332		
MW3	Compliance Well #2	8.370	5.810	6.560		
MW4	Compliance Well #3	7.760	5.610	6.342		
CB	Compliance Well #4	7.820	5.460	6.659		
	Compliance Well #5					

LAGOON CLOSURE PLAN

FOR THE
TYSON FOODS, INC.
POULTRY PROCESSING PLANT
AT
GLEN ALLEN, VIRGINIA



APRIL 9, 1992

SUBMITTED BY
REID ENGINEERING COMPANY, INC.

1211 CAROLINE STREET
FREDERICKSBURG, VIRGINIA 22401
(703) 371-8500, FAX. (703) 371-8576

LAGOON CLOSURE PLAN
FOR
TYSON FOODS, INC.
POULTRY PROCESSING PLANT
Glen Allen, VA

I. INTRODUCTION

This report presents a proposed closure plan for three (3) wastewater treatment lagoons at the Tyson Foods, Inc. Poultry Processing Plant in Glen Allen, VA. The closure plan and subsequent closure of the lagoons have been mandated by the Virginia Water Control Board. This report includes:

- * site description,
- * description of the proposed lagoon closure procedure,
- * post-closure maintenance plan,
- * proposed lagoon closure schedule.

II. DESCRIPTION OF SITE & EXISTING LAGOONS

The Tyson Foods, Inc. Poultry Processing Plant is located approximately 18 miles north west of Richmond, VA on Highway 33. The plant was purchased by Holly Farms in 1963 for the processing of poultry products. The three (3) wastewater treatment lagoons to be closed were constructed in 1968 east of the plant facility to treat wastewater generated in the processing operation. The lagoons include one anaerobic lagoon (Lagoon No. 1) and two (2) unaerated lagoons for storage of waste activated sludge (Lagoon No. 3 and No. 4). The site is shown in Appendix I - Topographic Map of Lagoon Closure Area. The three (3) lagoons were constructed using on-site soils on the bottom and side slopes. At the time of construction, these soils were not tested for compaction or permeability. The effectiveness of these soils in preventing leakage is, therefore, questionable. Groundwater monitoring data gathered by Tyson Foods, Inc. in 1990 and 1991, indicates concentrations of certain pollutants to be elevated above background groundwater quality levels. Use of these lagoons will be discontinued after proposed improvements to the wastewater treatment system are completed in late 1992. A system of groundwater collection wells and well pumps will also be installed in 1992 to achieve groundwater remediation to background levels.

Sludge thickness measurements and sampling have also been performed in each lagoon. As shown in Appendix II, Lagoon

Sludge Accumulation Measurements, approximately 16.0 feet (259,000 ft³) of accumulated sludge presently exists in sludge storage Lagoon No. 3 which is filled with solids. Approximately 1.5 feet of sludge (12,100 ft³) exists on the bottom sludge storage Lagoon No. 4 which has a total depth of 12.5 feet.. Approximately 16.0 feet of accumulated bottom sludge and floating solids (300,000 ft³) are present in existing Anaerobic Lagoon #1 which is filled with solids.

Testing of a representative composite sample of the sludge in each lagoon was performed and the results are enclosed in Appendix IV, Report of Laboratory Analysis of Accumulated Sludge Solids.

III. DESCRIPTION OF PROPOSED LAGOON CLOSURE PROCEDURE

The closure of the three lagoons at the Tyson Foods, Glen Allen, VA treatment plant site will be accomplished with sludge materials in place in the following steps:

1. After the proposed treatment system upgrade is completed and on-line, discontinue input of wastewater into the existing anaerobic lagoon and input of sludge into the two existing sludge lagoons.
2. The two existing 12" diameter inlet pipes into existing Anaerobic Lagoon #1 will be abandoned and plugged with concrete. The existing 4" diameter pipe inlets into Lagoons #3 and #4 will be abandoned and plugged with concrete. The existing 6" diameter overflow pipe from Lagoons #3 into Lagoon #5 will be abandoned and plugged with concrete. The 4" diameter sludge waste force main to Lagoons #3 and #4 will be plugged downstream of the tee connection and inlet control valve to the proposed new waste sludge lagoon and the old force main pipe to Lagoons #3 and #4 will be abandoned.
3. Gradually pump out liquid wastewater from all three lagoons into the treatment system for ultimate disposal; and, continue to pump out collected rainwater from the lagoons into the treatment system for ultimate disposal as necessary in the future.
4. Optionally pump out accumulated solids from each of the lagoons by a commercial sludge disposal company for ultimate disposal by land application on VA SWCB approved sites.
5. Regularly seed accumulated solids in the lagoons with commercially purchased Byo-Gon biological life activator (See Appendix V - Byo-Gon Activator Information) to attempt to accelerate the reduction of accumulated sludge solids volume by endogenous respiration.

6. Continue to monitor the quality of groundwater collected in the recovery wells, by analyzing on a quarterly frequency, samples pumped from the groundwater remediation recovery well system until groundwater pollutant levels are either reduced to background levels or to relatively stable levels which do not cause groundwater quality to be at risk.
7. Continue to monitor the levels of accumulated sludge in each lagoon to observe sludge volume reduction from endogenous respiration accomplished by dosage of Byo-Gon activator.

IV. POST CLOSURE MAINTENANCE PLAN

This proposed "materials in place" lagoon closure plan is not a "clean close" grade over plan but is essentially a long term lagoon management plan. This lagoon closure or management plan is especially suitable when accomplished simultaneously with the proposed Groundwater Remediation Plan in which groundwater will be collected, tested and recycled to the Tyson Foods, Glen Allen treatment plant for ultimate disposal.

This lagoon closure plan is proposed based on the assumption that discontinuing operation of these lagoons combined with lagoon solids volume reduction and lagoon supernatant disposal will eliminate further potential seepage of pollutants into the groundwater. This closure goal will be confirmed by ongoing groundwater sampling and testing during the Groundwater Remediation Phase coupled with the backup protection of the groundwater collection, pumping, treatment, and disposal plan.

V. PROPOSED LAGOON CLOSURE SCHEDULE

EVENT	DATE
1. Complete construction and start-up of Groundwater Remediation Well System and begin initial groundwater collection phase prior to elimination of operation of unlined treatment lagoons.	Aug. 15, 1992
2. Complete construction of treatment plant upgrade and eliminate operation of unlined treatment lagoons.	March 15, 1993
3. Commence liquid waste pump-out from the lagoons into the upgraded wastewater treatment system.	June 15, 1993
4. Complete optional pump-out of accumulated solids from lagoon by commercial sludge disposal company.	Sept. 15, 1993
5. Commence Byo-Gon activator dosage to reduce residual sludge volumes in lagoons.	April 1, 1994
6. Discontinue Byo-Gon activator dosage into the lagoons.	April 1, 1995
7. Monitor residual sludge characteristics and accumulated sludge depths on each lagoon and pump out rainwater from lagoons to treatment system.	Commence on April 1, 1994 continue into future as required by VA SWCB

Topographic Map of Lagoon Closure Area

1

Lagoon Sludge Accumulation Measurements

2

Cross Sections of Existing Lagoons

3

Report of Laboratory Analysis

4

Byo-Gon Activator Information

5

Groundwater Remediation Plan Letter of Approval with Conditions dated January 9, 1992



COMMONWEALTH of VIRGINIA
STATE WATER CONTROL BOARD

Richard N. Burton
Executive Director

4900 Cox Road

Gerard Seeley, Jr.
Regional Director

Please reply to: Piedmont Regional Office
P. O. Box 11143
Richmond, Virginia 23230
(804) 527-5020

January 9, 1992

Mr. John H. Reid
President
Reid Engineering Company, Inc.
1211 Caroline Street
Fredericksburg, Virginia 22401

RE: Tyson Foods, Inc., Glen Allen, Virginia
Ground Water Remediation Plan

Dear Mr. Reid:

The staff of the State Water Control Board has reviewed the supplement dated October 21, 1991 to the ground water remediation plan for Tyson Foods, Glen Allen. The proposed abatement procedures are technically adequate and the plan is approved subject to the following conditions:

1. Please confirm the pumping schedule for the recovery wells. The January 14, 1991 plan indicated that pumping was to be continuous at a rate of approximately 24 gallons per minute (2 gallons per minute per well). We understand that to mean that the recovery wells are to be pumped 24 hours per day, 7 days per week.
2. All monitoring reports are to be submitted by the tenth of the month following the monitoring period.
3. An annual status report is required in January 1993 and yearly thereafter, if necessary. A completion report is also required.
4. Regarding Appendix 3 -- Ground Water Remediation Plan Implementation Schedule, the monitoring following abatement must be done at least monthly for a period of 6 months. The perpetual monitoring, if needed, must be done on a quarterly basis.
5. The ground water monitoring program approved in March 1990 requires quarterly monitoring for a more comprehensive list of constituents than the indicator parameters cited in the October 21 submittal. The quarterly monitoring required by the March 1990 approval must continue. That monitoring will

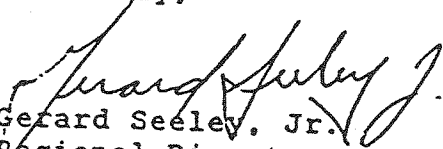
Page 2
Mr. John H. Reid
Tyson Foods, Inc., Glen Allen
January 9, 1992

also satisfy the needs of the abatement plan when the sample times coincide.

6. A Lagoon Closure Plan will be submitted for review and approval by February 14, 1992.
7. We reserve the right to require additional site assessment and site characterization if the need for such work is identified during the abatement program.

Please contact Ray Jenkins (527-5037) or B. N. Sinha (527-5054) if you have any questions.

Sincerely,


Gerard Seeley, Jr.
Regional Director

/rrj

cc: Mr. Larry C. Moyer -- Tyson Foods, Inc.



Reid Engineering Company, Inc.

703-371-8500
703-786-2733
FAX 703-371-8576

Consulting Environmental Engineers
Industrial Wastewater Treatment Specialists

1211 CAROLINE STREET, FREDERICKSBURG, VIRGINIA 22401

October 21, 1991



Mr. Ray Jenkins, Jr.
Environmental Engineer Senior
Piedmont Regional Office
State Water Control Board
Commonwealth of Virginia
4900 Cox Road
Innsbrook Corporate Center
P. O. Box 11143
Richmond, Virginia 23230

SUBJECT: TYSON FOODS, INC., GLEN ALLEN, VIRGINIA
GROUNDWATER REMEDIATION PLAN

Dear Ray:

As you requested in our meeting on September 25, 1991 concerning the proposed Tyson Foods, Glen Allen, Virginia groundwater remediation plan, this letter and attached groundwater contour map, aquifer analysis, and implementation schedule are submitted to the State Water Control Board to provide the additional information that you requested during our meeting.

As requested by Dr. Sinha, a groundwater contour map has been prepared and is attached in Appendix #1. This groundwater contour map clearly indicates a south to southeasterly flow of groundwater under the existing lagoons. This groundwater contour map also indicates that, at present, the unnamed tributary stream at the south end of the Glen Allen processing plant site is the present final discharge point for groundwater flow under the existing lagoons. The proposed groundwater remediation plan will call for the installation of twelve groundwater recovery wells across the south end of the new treatment plant site. Proper operation of this groundwater recovery-remediation system will result in elimination of contaminated groundwater flow into the unnamed tributary stream.

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Virginia State Water Control Board
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As emphasized by Mr. Bill Barker, hydrogeologist for Tyson Foods on this project, because the hydraulic gradient of the shallow groundwater slopes and flows toward the surface water in the unnamed tributary from both the North and South sides of the tributary, the present extent of groundwater contamination should be limited to the groundwater on the North side of the unnamed tributary stream and the stream flow itself. Also, because of the original topography of the site prior to construction of the treatment ponds, contaminant migration is unlikely East and West of the pond sites. Before construction of the ponds a large drainage swale existed directing runoff toward the unnamed tributary. This source of contaminated groundwater flow into the unnamed tributary stream should be eliminated by the proposed groundwater remediation plan.

As requested by Dr. Sinha, the groundwater remediation plan will be revised to use only existing upgradient Monitoring Well #1 as an indicator well for background groundwater quality.

As requested by Dr. Sinha, aquifer analysis including determinations of hydraulic gradient, hydraulic conductivity, transitivity and storativity are provided in Appendix #2. These analyses have been prepared by Mr. Bill Barker, P.G., Consulting Hydrogeologist for Tyson Foods, Inc. As noted in the discussion in Appendix #2 prepared by Mr. Barker, this hydrogeologic information indicates that the proposed recovery well system should be able to collect 100% of the groundwater flow from under the treatment plant lagoon site to the unnamed tributary located at the South boundary of the Tyson Foods processing site.

As requested, Reid Engineering Company has prepared a proposed Groundwater Remediation Plan Implementation Schedule which is contained in Appendix #3. Please be advised that this implementation schedule has used available hydrogeologic data for the Glen Allen site to prepare a rough estimate that approximately 15 months will be required from the time that wastewater inflow into the existing unlined treatment lagoons is eliminated to the point in time where the proposed groundwater collection and treatment program has resulted in the elimination of the entrance of further pollutants into the groundwater flow and the production of groundwater quality equal to the background quality of upgradient Monitoring Well #1. The proposed groundwater remediation plan contains the following four phases:

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1. Initial groundwater collection and pumping phase prior to elimination of operation of existing unlined waste treatment lagoons.
2. Groundwater remediation phase after new treatment system improvements are operational and further operation of existing unlined waste treatment lagoons is eliminated.
3. Post remediation phase with reduced groundwater monitoring schedule.
4. Perpetual monitoring phase with periodic groundwater monitoring.

As agreed in our meeting, the following parameters will be tested as indicator pollutants in the groundwater samples taken from MW #1, 2, 3 & 4 during all phases of the remediation plan:

Ammonia
TKN
TDS
Specific Conductivity
pH
Zinc

One composite sample of the combined pumped groundwater flow will also be obtained from the proposed new groundwater collection manhole for testing.

Reid Engineering Company will be submitting a Lagoon Closure Plan for the Glen Allen site to the State Water Control Board by mid December. As you noted in our meeting, the requirement for a Perpetual Monitoring Phase at the end of the remediation work will depend upon the closure method proposed by Tyson Foods, Inc. in the Lagoon Closure Plan.

As noted by Mike Motsinger, assistant processing plant manager at Glen Allen, Tyson Foods desires to obtain expedited approval of the proposed groundwater remediation plan from the Virginia State Water Control Board so that they can proceed with the installation and operation of the groundwater remediation recovery wells to improve groundwater quality as rapidly as possible. Tyson Foods desires to eliminate the seepage of contaminants from the existing

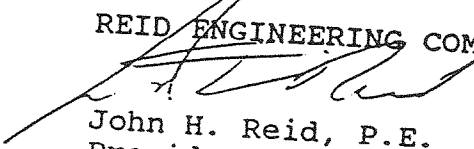
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unlined lagoons; contain existing groundwater flow; and eliminate any negative effects of groundwater flow on receiving stream water quality by implementation and start-up of this groundwater collection, pumping and remediation plan by January 1, 1992 as noted on the proposed implementation schedule.

If you have questions or need additional information please call.

Best Regards,

REID ENGINEERING COMPANY, INC.


John H. Reid, P.E.
President

cc: Mike Motsinger
Larry Moyer
Danny Wyatt
Gene Newman
CTF28C08/JHR/ca

EVENT	DATE	TESTING SCHEDULE
1. Initial groundwater collection phase prior to elimination of operation of unlined treatment lagoons	Jan. 1, 1992	1/3 months
2. Complete construction of waste-water treatment system improvements and eliminate operation of unlined treatment lagoons	Oct. 1, 1992	1 test by Jan. 1, 1993
3. Groundwater Remediation Phase	Commence Jan. 1, 1993	1/month
4. Groundwater Remediation Phase by achieving groundwater equal to quality of upgradient MW #1	Jan. 1, 1994	1/month
5. Post remediation phase to confirm completion of remediation plan	Jan. 1, 1995	6 tests over 12 month period
6. Perpetual monitoring phase	No Completion Date	1/12 months

Attachment H: Whole Effluent Toxicity Evaluation



MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY Piedmont Regional Office

4949-A Cox Road, Glen Allen, Virginia 23060

804/527-5020

TO: Deborah DeBiasi, State Coordinator Whole Effluent Toxicity Program, OWPCA
FROM: Tamira Cohen, PRO Environmental Engineer, Sr.
DATE: December 1, 2010
SUBJECT: TMP Data Evaluation and Review for Tyson Foods/Tyson Farms, VA0004031
COPIES: File

Facility Name:	Tyson Farms, Inc. DBA Tyson Foods, Inc. – Glen Allen Complex
Permit Number:	VA0004031
Maximum 30-day Effluent Flow:	2.067 MGD
Design Flow:	1.25 MGD
Receiving Stream:	UT to Chickahominy River
Instream Waste Concentration (IWC):	100%
Facility SIC:	2015

Facility Description:

The Tyson Foods – Glen Allen Complex is processed as an industrial minor facility. The industrial discharge consists of treated wastewater resulting from the operations at a poultry processing facility (slaughter, meat cut preparations, packaging for human consumption and poultry processing for pet food), facility cleaning operations, and facility domestic sanitary waste.

Facility Requirements:

The current permit (expired November 13, 2010) requires quarterly Whole Effluent Toxicity (WET) testing (Chronic 3-Brood Static Renewal Survival and Reproduction Test, *Ceriodaphnia dubia* in odd numbered years) and (Chronic 7-Day Static Renewal Survival and Growth Test, *Pimephales promelas* in even numbered years). The special condition set the criteria of NOEC = 69% or TU_c of 1.44.

Data Summary:

This data review includes the results of 11 and 10 sets of quarterly testing for each of *Ceriodaphnia dubia* and *Pimephales promelas*, respectively. Testing was performed by Meritech, Inc. (2005 to 2007) and then Coastal Bioanalysts, Inc. (2007 to 2010). All tests were conducted in accordance with approved protocol.

Results of Chronic Toxicity Tests using *Ceriodaphnia dubia*

TEST DATE (start date)	NOEC		T.U. _c		48 HR - LC ₅₀	IC ₂₅	SURVIVAL IN 100% EFFLUENT	TEST LAB
	Survival	Reproduction	Survival	Reproduction				
13-Dec-2005	100%	100%	1.00	1.00	>100%	>100%	NR	MI
16-Jan-2007	75%	23%	1.33	4.35	>100%	34.50	60%	MI
21-Mar-2006	100%	100%	1.00	1.00	>100%	>100%	NR	MI
20-Mar-2007	100%	45%	1.00	2.22	79.5	>100%	NR	MI
22-May-2007	100%	100%	1.00	1.00	>100%	>100%	90%	MI
10-Jul-2007	100%	100%	1.00	1.00	>100%	87.90	80%	CBI
7-Nov-2007	100%	69%	1.00	1.44	>100%	72.80	100%	CBI
3-Feb-2009	100%	100%	1.00	1.00	>100%	>100%	100%	CBI
21-Apr-2009	100%	100%	1.00	1.00	>100%	>100%	100%	CBI
23-Jul-2009	100%	83%	1.00	1.20	>100%	>100%	100%	CBI
22-Oct-2009	100%	69%	1.00	1.45	>100%	72.20	70%	CBI

Note: NR = Not Reported; MI = Meritech, Inc.; CBI = Coastal Bioanalysts, Inc.

Results of Chronic Toxicity Tests using *Pimephales promelas*

TEST DATE (start date)	NOEC		T.U. _c		48 HR - LC ₅₀	IC ₂₅	SURVIVAL IN 100% EFFLUENT	TEST LAB
	Survival	Growth	Survival	Growth				
16-May-2006	100%	100%	1.00	1.00	>100%	>100%	100%	MI
22-Aug-2006	100%	100%	1.00	1.00	>100%	>100%	100%	MI
23-Jan-2007	100%	100%	1.00	1.00	>100%	>100%	100%	MI
14-Oct-2008	83%	83%	1.20	1.20	>100%	>100%	85%	CBI
15-Jul-2008	100%	100%	1.00	1.00	>100%	>100%	100%	CBI
24-Jun-2008	100%	100%	1.00	1.00	>100%	>100%	100%	CBI
13-Mar-2008	100%	100%	1.00	1.00	>100%	>100%	100%	CBI
17-Aug-2010	100%	100%	1.00	1.00	>100%	>100%	100%	CBI
4-May-2010	100%	100%	1.00	1.00	>100%	>100%	95%	CBI
23-Feb-2010	100%	100%	1.00	1.00	>100%	>100%	98%	CBI

Note: MI = Meritech, Inc.; CBI = Coastal Bioanalysts, Inc.

Discussion:

Statistical data evaluation was performed using STATS.exe. The test endpoints used in the data evaluation were the lowest NOEC's (converted to TU_C) reported for each of the paired chronic tests performed on a specific date. These test endpoints were consistently the reproduction TU_C in *C. dubia* and growth TU_C in *P. promelas*. STATS.exe results are listed below.

Chemical = WET – TU_C (<i>C. dubia</i>) Chronic averaging period = 4 WLAa = 3 WLAc = 1 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 11 Expected Value = 1.48973 Variance = 0.540259 C.V. = 0.493393 97th percentile daily values = 3.21446 97th percentile 4 day average = 2.28474 97th percentile 30 day average = 1.74215 # < Q.L. = 0 Model used = lognormal A limit is needed based on Chronic Toxicity Maximum Daily Limit = 1.40692274293467 Average Weekly limit = 1.40692274293467 Average Monthly Limit = 1.40692274293467 The data (TU_C) are: <div style="text-align: center;"> 1 4.35 1 2.22 1 1 1.44 1 1 1.2 1.45 </div>	Chemical = WET – TU_C (<i>P. promelas</i>) Chronic averaging period = 4 WLAa = 3 WLAc = 1 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 10 Expected Value = 1.02009 Variance = 0.003464 C.V. = 5.770308 97th percentile daily values = 1.13505 97th percentile 4 day average = 1.07652 97th percentile 30 day average = 1.04030 # < Q.L. = 0 Model used = lognormal A limit is needed based on Chronic Toxicity Maximum Daily Limit = 1.05437147183784 Average Weekly Limit = 1.05437147183784 Average Monthly Limit = 1.05437147183784 The data (TU_C) are: <div style="text-align: center;"> 1 1 1 1.2 1 1 1 1 1 1 </div>
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Statistical evaluation of both species test end points resulted in limitation recommendations based on chronic toxicity. Toxicity of the discharge to *C. dubia* has been demonstrated and a limitation recommendation of NOEC = 72% and TU_C = 1.38 will be required in this permit reissuance. All of the 10 NOEC test results for *P. promelas* were greater than the compliance endpoint in the previous permit, and thus reasonable potential for the toxicity of the discharge to this vertebrate species has not been demonstrated. One of the test results reported was less than the chronic NOEC of 100% (reported as 83%). Using best professional judgment, a limitation will not be based on these test results.

Recommendations:

In accordance with TMP Guidance 2000 (DEQ Guidance Memo No. 00-2012), data evaluation, and best professional judgment, it was determined that: 1) the facility continue conducting quarterly chronic toxicity tests (Chronic 3-Brood Static Renewal Survival and Reproduction Test using *C. dubia* until the WET limit

is effective 2) a new WET limitation of NOEC = 72% and $TU_c = 1.38$ be established for *C. dubia* with a 4 year compliance schedule.

(1) WET testing permit section to be included in current permit reissuance is as follows:

C. WHOLE EFFLUENT TOXICITY (WET) LIMITATION REQUIREMENTS

1. The Whole Effluent Toxicity limitation of $\leq 1.38 TU_c$ (NOEC $\geq 72\%$) in Part I.A. is a final limit with an effective date of 4 years from the effective date of this permit.
2. Commencing within the first month after the effective date of the limit, the permittee shall conduct quarterly Chronic 3-Brood Static Renewal Survival and Reproduction Tests using *Ceriodaphnia dubia* using 24-hour flow-proportioned composite samples of final effluent from outfall 001.

These chronic tests shall be conducted in such a manner and at sufficient dilutions (minimum of five dilutions, derived geometrically) to determine the "No Observed Effect Concentration" (NOEC) for survival and reproduction. The test endpoint (72%) must be represented by a dilution, and if other than 100%, should be bracketed by at least one dilution above and one dilution below it. Results which cannot be determined (i.e., a "less than" NOEC value) are not acceptable, and a retest will have to be performed. A retest of a non-acceptable test must be performed during the same compliance period as the test it is replacing. Express the test NOEC as TU_c (Chronic Toxic Units), by dividing 100/NOEC for DMR reporting. The IC_{25} should be included on the submitted test reports. A copy of the toxicity test results shall be submitted with the DMR. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

3. The permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters.
4. The permittee shall report the results on the quarterly DMR and submit a copy of each toxicity test report in accordance with the following schedule:

Test Period	Test Period Dates	DMR/Report Due Date
Quarter 1	Jan 1 – March 31, 2011	Apr 10, 2011
Quarter 2	Apr 1 – Jun 30, 2011	Jul 10, 2011
Quarter 3	Jul 1 – Sep 30, 2011	Oct 10, 2011
Quarter 4	Oct 1 – Dec 31, 2011	Jan 10, 2012
Quarter 5	Jan 1 – March 31, 2012	Apr 10, 2012
Quarter 6	Apr 1 – Jun 30, 2012	Jul 10, 2012
Quarter 7	Jul 1 – Sep 30, 2012	Oct 10, 2012
Quarter 8	Oct 1 – Dec 31, 2012	Jan 10, 2013
Quarter 9	Jan 1 – March 31, 2013	Apr 10, 2013
Quarter 10	Apr 1 – Jun 30, 2013	Jul 10, 2013
Quarter 11	Jul 1 – Sep 30, 2013	Oct 10, 2013
Quarter 12	Oct 1 – Dec 31, 2013	Jan 10, 2014
Quarter 13	Jan 1 – March 31, 2014	Apr 10, 2014
Quarter 14	Apr 1 – Jun 30, 2014	Jul 10, 2014
Quarter 15	Jul 1 – Sep 30, 2014	Oct 10, 2014
Quarter 16	Oct 1 – Dec 31, 2014	Jan 10, 2015
Quarter 17	Jan 1 – March 31, 2015	Apr 10, 2015
Quarter 18	Apr 1 – Jun 30, 2015	Jul 10, 2015
Quarter 19	Jul 1 – Sep 30, 2015	Oct 10, 2015
Quarter 20	Oct 1 – Dec 31, 2015	Jan 10, 2016

(2) WET testing permit section to be included in current permit reissuance is as follows:

D. WHOLE EFFLUENT TOXICITY (WET) MONITORING REQUIREMENTS

1. Within the first quarter after the effective date of the permit, the permittee shall conduct quarterly chronic toxicity tests on Outfall 001 using 24-hour flow-proportioned composite samples until the WET limit of Part 1.A. is effective. The test to use is the Chronic 3-Brood Survival and Reproduction Static Renewal Test using *Ceriodaphnia dubia*.
2. These chronic tests shall be conducted in such a manner and at sufficient dilutions (minimum of five dilutions, derived geometrically) to determine the "No Observed Effect Concentration" (NOEC) for survival and reproduction. Results which cannot be quantified (i.e., a "less than" NOEC value) are not acceptable, and a retest will have to be performed. A retest of a non-acceptable test must be performed during the same compliance period as the test it is replacing. Express the test NOEC as TU_c (Chronic Toxic Units), by dividing $100/NOEC$ for DMR reporting. Report the LC_{50} at 48 hours and the IC_{25} with the NOEC in the test report.

The permittee may provide additional samples to address data variability. These data shall be reported and may be included in the evaluation of effluent toxicity. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

3. The test dilutions should be able to determine compliance with the following endpoints:

Chronic NOEC of $\geq 72\%$ equivalent to a TU_c of ≤ 1.38

4. The permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.
5. The permittee shall report the results on the quarterly DMR and submit a copy of each toxicity test report in accordance with the following schedule:

Test Period	Test Period Dates	DMR/Report Due Date
Quarter 1	Jan 1 – Mar 31, 2011	Apr 10, 2011
Quarter 2	Apr 1 – Jun 30, 2011	Jul 10, 2011
Quarter 3	Jul 1 – Sep 30, 2011	Oct 10, 2011
Quarter 4	Oct 1 – Dec 31, 2011	Jan 10, 2012
Quarter 5	Jan 1 – Mar 31, 2012	Apr 10, 2012
Quarter 6	Apr 1 – Jun 30, 2012	Jul 10, 2012
Quarter 7	Jul 1 – Sep 30, 2012	Oct 10, 2012
Quarter 8	Oct 1 – Dec 31, 2012	Jan 10, 2013
Quarter 9	Jan 1 – Mar 31, 2013	Apr 10, 2013
Quarter 10	Apr 1 – Jun 30, 2013	Jul 10, 2013
Quarter 11	Jul 1 – Sep 30, 2013	Oct 10, 2013
Quarter 12	Oct 1 – Dec 31, 2013	Jan 10, 2014
Quarter 13	Jan 1 – Mar 31, 2014	Apr 10, 2014
Quarter 14	Apr 1 – Jun 30, 2014	Jul 10, 2014
Quarter 15	Jul 1 – Sep 30, 2014	Oct 10, 2014
Quarter 16	Oct 1 – Dec 31, 2014	Jan 10, 2015
Quarter 17	Jan 1 – Mar 31, 2015	Apr 10, 2015
Quarter 18	Apr 1 – Jun 30, 2015	Jul 10, 2015
Quarter 19	Jul 1 – Sep 30, 2015	Oct 10, 2015
Quarter 20	Oct 1 – Dec 31, 2015	Jan 10, 2016

(3) Part I.A. section to be included in current permit reissuance is as follows:

A. LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from Outfall **001**.
 - a. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
720 Toxicity, Chronic (TU _C)[<i>C.dubia</i>] ⁽¹⁾ (Interim)	NA	NA	NA	NA	1/Quarter	24 HC
720 Toxicity, Chronic (TU _C)[<i>C.dubia</i>] ⁽²⁾⁽³⁾ (Final)	NA	NA	NA	1.38	1/Quarter	24 HC

NA = Not Applicable 24HC = 24-Hour Composite

Notes:

- (1) See Part I.D. for monitoring requirements for Whole Effluent Toxicity.
- (2) See Part I.C. for limit requirements for Whole Effluent Toxicity.
- (3) See Part I.B.X. for Schedule of Compliance.

(3) Part I.B.X section to be included in current permit reissuance is as follows:

B.X. COMPLIANCE SCHEDULE FOR CHRONIC WHOLE EFFLUENT TOXICITY LIMIT

The permittee shall achieve compliance with the final limit for Chronic Whole Effluent Toxicity as specified in Part I.A.1 in this permit in accordance with the following schedule:

SCHEDULE OF COMPLIANCE FOR CHRONIC WHOLE EFFLUENT TOXICITY	
1. Prepare progress reports.	Annually beginning 1 year from the permit effective date.
2. Achieve compliance with the final effluent limitation for Final Chronic Whole Effluent Toxicity.	No later than 4 years from the permit effective date.

No later than 14 calendar days following the dates identified in the above schedules of compliance, the permittee shall submit to the Piedmont Regional Office, either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Spreadsheet for determination of WET test endpoints or WET limits														
2															
3															
4	Excel 97			Acute Endpoint/Permit Limit			Use as LC₅₀ in Special Condition, as TUA on DMR								
5	Revision Date: 01/10/05														
6	File: WETLIM10.xls			ACUTE 100% = NOAEC			LC₅₀ = NA			% Use as		NA	TUA		
7	(MIX.EXE required also)			ACUTE WLA_a 0.3			Note: Inform the permittee that if the mean of the data exceeds this TUA: 1.0 a limit may result using WLA.EXE								
8															
9															
10															
11				Chronic Endpoint/Permit Limit			Use as NOEC in Special Condition, as TUC on DMR								
12															
13				CHRONIC 1.40691066 TUC			NOEC = 72 % Use as			1.38		TUC			
14				BOTH* 3 TUC			NOEC = 34 % Use as			2.94		TUC			
15				AML 1.40691066 TUC			NOEC = 72 % Use as			1.38		TUC			
16	Enter data in the cells with blue type:														
17	Entry Date: 12/01/10														
18	Facility Name: Tyson Foods - Glen Allen			ACUTE WLA_{a,c} 3			Note: Inform the permittee that if the mean of the data exceeds this TUC: 1.0								
19	VPDES Number: VA0004031			CHRONIC WLA_c 1			a limit may result using WLA.EXE								
20	Outfall Number: 001			* Both means acute expressed as chronic											
21															
22	Plant Flow: 2.067 MGD			% Flow to be used from MIX.EXE			Difuser /modeling study?								
23	Acute 1Q10: 0 MGD			100 %			Enter Y/N N								
24	Chronic 7Q10: 0 MGD			100 %			Acute 1 :1								
25							Chronic 1 :1								
26	Are data available to calculate CV? (Y/N)			y (Minimum of 10 data points, same species, needed)			Go to Page 2								
27	Are data available to calculate ACR? (Y/N)			n (NOEC<LC50, do not use greater/less than data)			Go to Page 3								
28															
29															
30	IWC _a 100 % Plant flow/plant flow + 1Q10			NOTE: If the IWC_a is >33%, specify the											
31	IWC _c 100 % Plant flow/plant flow + 7Q10			NOAEC = 100% test/endpoint for use											
32															
33	Dilution, acute 1 100/IWC _a														
34	Dilution, chronic 1 100/IWC _c														
35															
36	WLA _a 0.3 Instream criterion (0.3 TUA) X's Dilution, acute														
37	WLA _c 1 Instream criterion (1.0 TUC) X's Dilution, chronic														
38	WLA _{a,c} 3 ACR X's WLA _a - converts acute WLA to chronic units														
39															
40	ACR -acute/chronic ratio 10 LC50/NOEC (Default is 10 - if data are available, use tables Page 3)														
41	CV-Coefficient of variation 0.493373209 Default of 0.6 - if data are available, use tables Page 2)														
42	Constants eA 0.46345743 Default = 0.41														
43	eB 0.652043199 Default = 0.60														
44	eC 2.157695476 Default = 2.43														
45	eD 2.157695476 Default = 2.43 (1 samp)			No. of samples: 1			**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAA,c and MDL using it are driven by the ACR.								
46															
47	LTA _{a,c} 1.39037229 WLA _{a,c} X's eA														
48	LTA _c 0.652043199 WLA _c X's eB														
49	MDL** with LTA _{a,c} 3 TUC NOEC = 33.333333 (Protects from acute/chronic toxicity)						Rounded NOEC's			%					
50	MDL** with LTA _c 1.40691066 TUC NOEC = 71.077719 (Protects from chronic toxicity)						NOEC =			34 %					
51	AML with lowest LTA 1.40691066 TUC NOEC = 71.077719 Lowest LTA X's eD						NOEC =			72 %					
52															
53	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TUC to TUA														
54															
55	MDL with LTA _{a,c} 0.3 TUA LC50 = 333.333333 % Use NOAEC=100%						Rounded LC50's			%					
56	MDL with LTA _c 0.140691066 TUA LC50 = 710.777186 % Use NOAEC=100%						LC50 =			NA %					
57															
58															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
110																
111	Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)															
112																
113	To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results,															
114	acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute															
115	LC ₅₀ , since the ACR divides the LC ₅₀ by the NOEC. LC ₅₀ 's >100% should not be used.															
116																
117	Table 1. ACR using Vertebrate data															
118																
119																
120		Set #	LC₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use							
121		1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
122		2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
123		3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
124		4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
125		5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
126		6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
127		7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
128		8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
129		9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
130		10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
131																
132		ACR for vertebrate data:								0						
133																
134		Table 1. Result:				Vertebrate ACR				0						
135		Table 2. Result:				Invertebrate ACR				0						
136						Lowest ACR				Default to 10						
137																
138		Table 2. ACR using Invertebrate data														
139																
140																
141		Set #	LC₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use							
142		1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
143		2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
144		3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
145		4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
146		5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
147		6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
148		7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
149		8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
150		9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
151		10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
152																
153		ACR for vertebrate data:								0						
154																
155																
156																
157		DILUTION SERIES TO RECOMMEND														
158		Table 4.														
159						Monitoring		Limit								
160						% Effluent	TUc	% Effluent	TUc							
161			Dilution series based on data mean			100	1.0									
162			Dilution series to use for limit					72	1.3888889							
163			Dilution factor to recommend:			0.5		0.8485281								
164			Dilution series to recommend:			100.0	1.00	100.0	1.00							
165						50.0	2.00	84.9	1.18							
166						25.0	4.00	72.0	1.39							
167						12.5	8.00	61.1	1.64							
168						6.25	16.00	51.8	1.93							
169			Extra dilutions if needed			3.12	32.05	44.0	2.27							
170						1.56	64.10	37.3	2.68							
171																
172																

Convert LC₅₀'s and NOEC's to Chronic TU's
for use in WLA.EXE

Table 3. **ACR used:** 10

	Enter LC ₅₀	TUc	Enter NOEC	TUc
1	NO DATA			NO DATA
2	NO DATA			NO DATA
3	NO DATA			NO DATA
4	NO DATA			NO DATA
5	NO DATA			NO DATA
6	NO DATA			NO DATA
7	NO DATA			NO DATA
8	NO DATA			NO DATA
9	NO DATA			NO DATA
10	NO DATA			NO DATA
11	NO DATA			NO DATA
12	NO DATA			NO DATA
13	NO DATA			NO DATA
14	NO DATA			NO DATA
15	NO DATA			NO DATA
16	NO DATA			NO DATA
17	NO DATA			NO DATA
18	NO DATA			NO DATA
19	NO DATA			NO DATA
20	NO DATA			NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50,
enter it here: NO DATA %LC₅₀
NO DATA TUa

Cell: I9

Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18

Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22

Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40

Comment: If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41

Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48

Comment: See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62

Comment: Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62

Comment: Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117

Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119

Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121

Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUA. The calculation is the same: $100/\text{NOEC} = \text{TUc}$ or $100/\text{LC50} = \text{TUA}$.

Cell: C138

Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

Attachment I: NPDES Industrial Permit Rating Work Sheet

NPDES PERMIT RATING WORK SHEET

NPDES NO. VA0004031

- ☐ Regular Addition
☐ Discretionary Addition
☐ Score change, but no status change
☐ Deletion

Facility Name: Tyson Farms, Inc.

City: Glen Allen, VA

Receiving Water: Chickahominy River, UT

Reach Number: Outfall 001 2-XDD001.12; Outfall 002 2-XDD000.95

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

☐ YES; score is 600 (stop here) ☒ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

- ☐ YES; score is 700 (stop here)
☒ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: 2015 Other SIC Codes:
 Industrial Subcategory Code: 000 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	15	<input type="checkbox"/> 7.	7	35
<input checked="" type="checkbox"/> 1.	1	5	<input type="checkbox"/> 4.	4	20	<input type="checkbox"/> 8.	8	40
<input type="checkbox"/> 2.	2	10	<input type="checkbox"/> 5.	5	25	<input type="checkbox"/> 9.	9	45
			<input type="checkbox"/> 6.	6	30	<input type="checkbox"/> 10.	10	50

Code Number Checked: 1

Total Points Factor 1: 5

FACTOR 2: Flow/Stream Flow Volume (Complete either Section A or Section B; check only one)

Section A ☐ Wastewater Flow Only Considered

Wastewater Type (See Instructions)	Code	Points
Type I: Flow < 5 MGD <input type="checkbox"/>	11	0
Flow 5 to 10 MGD <input type="checkbox"/>	12	10
Flow > 10 to 50 MGD <input type="checkbox"/>	13	20
Flow > 50 MGD <input type="checkbox"/>	14	30
Type II: Flow < 1 MGD <input type="checkbox"/>	21	10
Flow 1 to 5 MGD <input checked="" type="checkbox"/>	22	20
Flow > 5 to 10 MGD <input type="checkbox"/>	23	30
Flow > 10 MGD <input type="checkbox"/>	24	50
Type III: Flow < 1 MGD <input type="checkbox"/>	31	0
Flow 1 to 5 MGD <input type="checkbox"/>	32	10
Flow > 5 to 10 MGD <input type="checkbox"/>	33	20
Flow > 10 MGD <input type="checkbox"/>	34	30

Section B ☐ Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of instream Wastewater Concentration at Receiving Stream Low Flow	Code	Points
Type I/III:	< 10 % <input type="checkbox"/>	41	0
	10 % to < 50 % <input type="checkbox"/>	42	10
	> 50 % <input type="checkbox"/>	43	20
Type II:	< 10 % <input type="checkbox"/>	51	0
	10 % to < 50 % <input type="checkbox"/>	52	20
	> 50 % <input type="checkbox"/>	53	30

Code Checked from Section A or B: 22

Total Points Factor 2: 20

FACTOR 3: Conventional Pollutants*(only when limited by the permit)*NPDES NO: VA0004031A. Oxygen Demanding Pollutant: (check one) ☒ XBOD ☐ COD ☐ Other: _____

Permit Limits: (check one)			Code	Points
<input checked="" type="checkbox"/>	X	< 100 lbs/day	1	0
<input type="checkbox"/>		100 to 1000 lbs/day	2	5
<input type="checkbox"/>		> 1000 to 3000 lbs/day	3	15
<input type="checkbox"/>		> 3000 lbs/day	4	20

Daily max 8mg/L X1.25 MDG X 8.34lbs/MG/mg/L = 83.4 lbs

Code Checked: _NA_**Points Scored:** _0_

B. Total Suspended Solids (TSS)

Permit Limits: (check one)			Code	Points
<input checked="" type="checkbox"/>	X	< 100 lbs/day	1	0
<input type="checkbox"/>		100 to 1000 lbs/day	2	5
<input type="checkbox"/>		> 1000 to 5000 lbs/day	3	15
<input type="checkbox"/>		> 5000 lbs/day	4	20

Daily max 7.5mg/L X1.25 MDG X 8.34lbs/MG/mg/L = 78.2 lbs

Code Checked: _1_**Points Scored:** _0_C. Nitrogen Pollutant: (check one) ☒ Ammonia ☐ Other: _____

Permit Limits: (check one)		Nitrogen Equivalent	Code	Points
<input checked="" type="checkbox"/>	X	< 300 lbs/day	1	0
<input type="checkbox"/>		300 to 1000 lbs/day	2	5
<input type="checkbox"/>		> 1000 to 3000 lbs/day	3	15
<input type="checkbox"/>		> 3000 lbs/day	4	20

Daily max 8mg/L X1.25 MDG X 8.34lbs/MG/mg/L = 83.4 lbs

Code Checked: _1_**Points Scored:** _0_**Total Points Factor 3:** _0_**FACTOR 4: Public Health Impact**

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

☐ YES (If yes, check toxicity potential number below)☒ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column ☐ check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	0	<input type="checkbox"/> 7.	7	15
<input type="checkbox"/> 1.	1	0	<input type="checkbox"/> 4.	4	0	<input type="checkbox"/> 8.	8	20
<input type="checkbox"/> 2.	2	0	<input type="checkbox"/> 5.	5	5	<input type="checkbox"/> 9.	9	25
			<input type="checkbox"/> 6.	6	10	<input type="checkbox"/> 10.	10	30

Code Number Checked: _NA_**Total Points Factor 4:** _0_

FACTOR 5: Water Quality Factors

NPDES NO.

- A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:*

<input checked="" type="checkbox"/>	Yes	Code 1	Points 10
<input type="checkbox"/>	No	2	0

- B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

<input checked="" type="checkbox"/>	Yes	Code 1	Points 0
<input type="checkbox"/>	No	2	5

- C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

<input checked="" type="checkbox"/>	Yes	Code 1	Points 10
<input type="checkbox"/>	No	2	0

Code Number Checked: A 1 B 1 C 1**Points Factor 5:** A 10 + B 0 + C 10 = 20 TOTAL**FACTOR 6: Proximity to Near Coastal Waters**

- A. *Base Score: Enter flow code here (from Factor 2):* 22 *Enter the multiplication factor that corresponds to the flow code:* 0.30

Check appropriate facility HPRI Code (from PCS):

HPRI#	Code	HPRI Score	Flow Code	Multiplication Factor
<input type="checkbox"/>	1	1	20	
<input type="checkbox"/>	2	2	0	
<input type="checkbox"/>	3	3	30	
<input checked="" type="checkbox"/>	4	4	0	
<input type="checkbox"/>	5	5	20	
			11, 31, or 41	0.00
			12, 32, or 42	0.05
			13, 33, or 43	0.10
			14 or 34	0.15
			21 or 51	0.10
			22 or 52	0.30
			23 or 53	0.60
			24	1.00

HPRI code checked: 4Base Score: (HPRI Score) 0 X (Multiplication Factor) 0.30 = 0 (TOTAL POINTS)

- B. *Additional Points* ☐ *NEP Program*

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points
<input type="checkbox"/> Yes	1	10
<input type="checkbox"/> No	2	0

NA

- C. *Additional Points* ☐ *Great Lakes Area of Concern*

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)

	Code	Points
<input type="checkbox"/> Yes	1	10
<input type="checkbox"/> No	2	0

NA

Code Number Checked:

A 4 B NA C NA**Points Factor 6:** A 0 + B NA + C NA = 0 TOTAL

SCORE SUMMARY

NPDES NO.

Factor	Description	Total Points
1	Toxic Pollutant Potential	<u> 5 </u>
2	Flows/Streamflow Volume	<u> 30 </u>
3	Conventional Pollutants	<u> 0 </u>
4	Public Health Impacts	<u> 0 </u>
5	Water Quality Factors	<u> 20 </u>
6	Proximity to Near Coastal Waters	<u> 0 </u>
TOTAL (Factors 1 through 6)		<u> 55 </u>

S1. Is the total score equal to or greater than 80? ☐ Yes (Facility is a major) ☒ No

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ No☐ Yes (Add 500 points to the above score and provide reason below:

Reason:

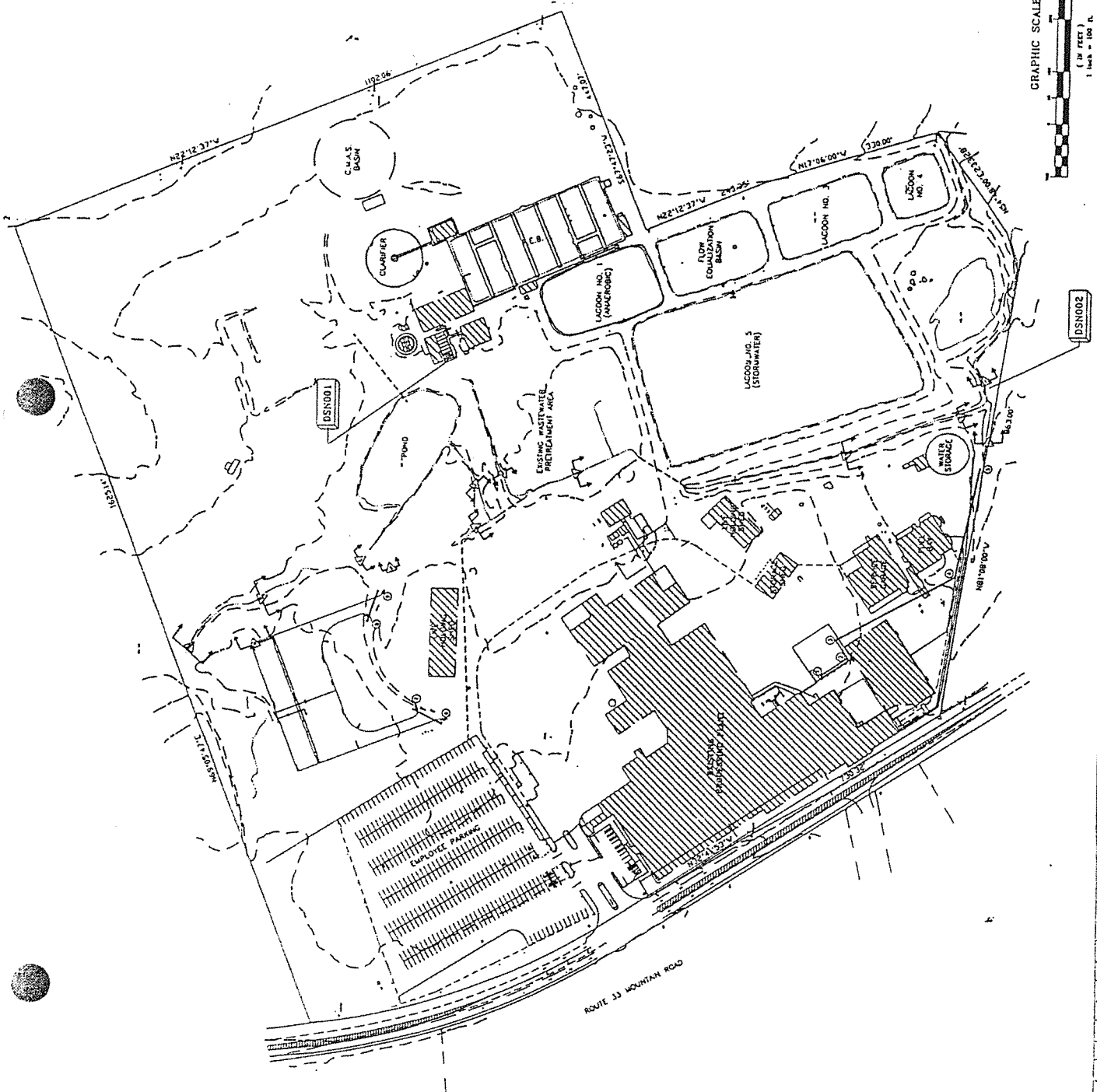
NEW SCORE: 55 OLD SCORE: 55 Janine Howard
Permit Reviewer's Name(804) 698-4299
Phone NumberApril 15, 2014
Date

Attachment J: Storm Water Drainage Map and Drainage Notes

GRAPHIC SCALE

(IN FEET)

1 inch = 100 ft.



Storm Water Drainage Notes.

Splitting the property down the main drainage conveyance in a Northwesterly direction all of the drainage from the eastern half drains primarily by sheet flow to the main channel, there are two conveyances contributing, one from the pond and one containing the discharge from DSN001.

On the westerly portion there is the conveyance from the parking lot and one from the truck parking area most of the area sheet flows to the main channel in the center with exception of a small portion to the south which sheet flows in the conveyance on the southern boundary. This conveyance then flows to the east and joins the main channel on the southern boundary of the property.

All of the storm water runoff from the site drains to the center of the property and then flows southerly to the property line where it turns in an easterly direction to the point of leaving the confines of Tyson property.

The roof area of the processing facility drains in two directions one is off the building through guttering systems and the other is through guttering and collection systems which convey the runoff to the waste water treatment system.

Attachment K: Storm Water Data (Outfall 002)

Outfall 002	Flow		pH		BOD5	TSS	Fecal Coliform	TP	NH ₃	TKN	Oil&Grease
	(MGD)		(SU)		(mg/L)	(mg/L)	(#/100ml)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Due Date	AVG	MAX	MIN	MAX	MAX	MAX	MAX	MAX	MAX	MAX	MAX
10-Jun-2010	0.809	0.809	6.8	6.8	<QL	4.5	1600	0.19	2	1.28	<QL
10-Jul-2010	0.792	0.792	7.3	7.3	<QL	2.9	300	<QL	<.5	<QL	<QL
10-Jan-2011	1.367	1.367	7.0	7.0	<QL	12.2	1600	0.55	1.04	4.3	<QL
10-Oct-2012	0.49	0.697	7.2	7.2	<QL	4.6	500	0.14	0.19	1.04	7.5
10-Apr-2012	0.687	1.34	7.0	7.0	5.2	25.8	1600	0.48	0.58	2.29	<5
10-Dec-2012	0.49	0.697	7.2	7.2	<QL	4.6	500	0.14	0.19	1.04	7.5
10-Jun-2013	0.49	0.697	7.2	7.2	<QL	4.6	500	0.14	0.19	1.04	7.5
10-Dec-2013	0.725	1.976	6.7	6.7	18.9	228	1600	0.48	0.46	2.45	<QL
AVG	0.731	1.047	7.04	7.0	12.1	35.9	1025	0.30	0.66	1.9	7.5
90th percentile	1.088	1.354	7.2	7.2	2.6	19.0	1600	0.52	1.52	3.3	7.5
10th percentile	0.490	0.697	6.9	6.9	<QL	3.7	400	0.07	0.19	0.5	<QL

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Part B –	List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.
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